

APPENDIX B

WASTE CERTIFICATIONS

APPENDIX B – Waste Certifications

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WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT AREA II ISRA OUTFALL 009 PLANNED EXCAVATION AP/STP-1A

Introduction

This report presents supporting detailed information for the July 28, 2010 in-situ characterization sampling of prospective soil wastes from planned SSFL Area II ISRA excavations in the vicinity of the former Area II incinerator.

Background

In-situ characterization was performed for soil destined to be excavated from designated locations in SSFL Area II in accordance with the ISRA Workplan. 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 or near planned excavation sites. The objective was to identify all substances potentially impacting the soil in each planned excavation footprint to the degree that hazardous waste regulatory thresholds would be exceeded.

The next step was to develop and implement a random sampling plan for each of the planned excavation footprints. The collected soil samples were analyzed by a state certified laboratory and the results evaluated to determine whether any of the identified substances were present at concentrations requiring further investigation. In addition, the initial random sampling results were evaluated to determine the statistical adequacy of the data provided for waste characterization based on the guidelines presented in U.S. EPA SW-846. 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 in lieu of further testing, the soil was summarily characterized as hazardous. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation AP/STP-1A was based partly on the Group 2 RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals (CAM17), Volatile Organic Compounds (VOC), Polychlorinated Biphenyls (PCB), and Petroleum Hydrocarbons should be addressed in the AP/STP-1A 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 CAM 17 metals, VOCs, PCBs, and Petroleum Hydrocarbons. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the planned excavation area at AP/STP-1A are presented in Test America report ITG2541 issued on 8/4/10. Only very low concentrations of Regulated Metals were detected in any of the samples from AP/STP-1A. All of the detected Regulated Metals were well below 10-Times their respective California Soluble Threshold Limits (STLC) and no further testing was required.

No VOCs or PCBs were detected in any of the samples, while Method Detection Limits (MDL) for all analytes were no higher than the low parts per billion range (ppb). Petroleum Hydrocarbons were detected at very low levels, with a maximum concentration in the C10-C40 range of 20 ppm.

Determination

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

- Is Not a Listed Waste (analytical results and 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 characteristic thresholds
 - Is Not subject to the Prop. 65 listing if it is applied to 22 CCR 66261.24(a)(7)
 - 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 AP/STP-1A is NON-HAZARDOUS.

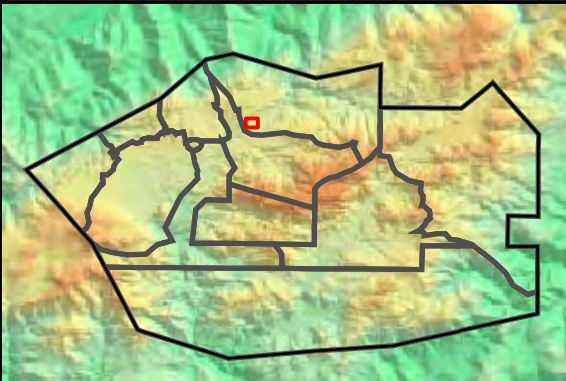
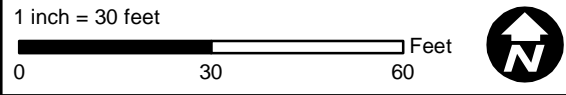
Outfall 009
Sample Locations for AP/STP - 1A

- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - Dirt Road
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Figure Legend**
- ▲ Waste Characterization Sample



Document: ISRA_Plots_SP_RD47_SampleLocations_060710.mxd Date: Jun 22, 2010



SANTA SUSANA FIELD LABORATORY

FIGURE X

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	APWC0801	APWC0802	APWC0803	APWC0804
				Sample Name:	APWC0801S001	APWC0802S001	APWC0803S001	APWC0804S001
				Collection Date:	7/28/2010	7/28/2010	7/28/2010	7/28/2010
				Sample Depth (feet):	0.5 - 1.0	0.5 - 0.75	0.5 - 1.0	0.5 - 1.0
ANALYTE	UNITS	TTLc	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
METALS								
Antimony	mg/kg	500	150	--	1.1 J	1.1 J	1.1 J	1.1 J
Arsenic	mg/kg	500	50	100	3.6	4.0	4.5	4.7
Barium	mg/kg	10,000	1,000	2,000	72	79	96	74
Beryllium	mg/kg	75	7.5	--	0.47 J	0.49	0.62	0.56
Cadmium	mg/kg	100	10	20	<0.20	<0.20	<0.20	<0.20
Chromium	mg/kg	500	50	100	16	16	23	21
Cobalt	mg/kg	8,000	800	--	4.6	3.8	5.4	4.6
Copper	mg/kg	2,500	250	--	7.7	8.2	11	10
Lead	mg/kg	1,000	50	100	4.1	40	7.1	8.8
Mercury	mg/kg	20	2	4	0.013 J	0.016 J	0.013 J	0.018 J
Molybdenum	mg/kg	3,500	3,500	--	0.65 J	0.68 J	0.75 J	0.86 J
Nickel	mg/kg	2,000	200	--	10	9.9	15	13
Selenium	mg/kg	100	10	20	<0.99	<0.99	<1	<0.99
Silver	mg/kg	500	50	100	<0.79	<0.79	<0.80	<0.79
Thallium	mg/kg	700	70	--	<0.79	<0.79	<0.80	<0.79
Vanadium	mg/kg	2,400	240	--	27	27	36	35
Zinc	mg/kg	5,000	2,500	--	38 B	57 B	53 B	52 M1, R-3, B
PCBs								
Aroclor 1016	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1221	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1232	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1242	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1248	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1254	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1260	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
TPH								
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	<0.15 {<0.39}	<0.14 {<0.38}	<0.15 {<0.40}	<0.14 {<0.37}
EFH (C10 - C24)	mg/kg	--	--	--	<6.6 {<4.7}	2.8 J	<3.3 {<2.3}	2.4 J
EFH (C10 - C40)	mg/kg	--	--	--	5.2 J	18	6.2	20
EFH (C25 - C40)	mg/kg	--	--	--	<6.6 {<4.7}	15	5.1	17
VOCs								
1,1,1,2-Tetrachloroethane	ug/kg	--	--	--	<2.1 {<0.59}	<1.9 {<0.54}	<2.2 {<0.61}	<2.0 {<0.57}
1,1,1-Trichloroethane	ug/kg	--	--	--	<1.0 {<0.72}	<0.96 {<0.67}	<1.1 {<0.75}	<1.0 {<0.70}
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	<2.1 {<0.89}	<1.9 {<0.82}	<2.2 {<0.92}	<2.0 {<0.86}
1,1,2-Trichloroethane	ug/kg	--	--	--	<1.0 {<0.90}	<0.96 {<0.83}	<1.1 {<0.94}	<1.0 {<0.87}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	APWC0801	APWC0802	APWC0803	APWC0804
				Sample Name:	APWC0801S001	APWC0802S001	APWC0803S001	APWC0804S001
				Collection Date:	7/28/2010	7/28/2010	7/28/2010	7/28/2010
				Sample Depth (feet):	0.5 - 1.0	0.5 - 0.75	0.5 - 1.0	0.5 - 1.0
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
1,1-Dichloroethane	ug/kg	--	--	--	<1.0 {<0.52}	<0.96 {<0.48}	<1.1 {<0.54}	<1.0 {<0.50}
1,1-Dichloroethene	ug/kg	--	--	14,000	<2.1 {<0.62}	<1.9 {<0.57}	<2.2 {<0.65}	<2.0 {<0.60}
1,1-Dichloropropene	ug/kg	--	--	--	<1.0 {<0.41}	<0.96 {<0.38}	<1.1 {<0.43}	<1.0 {<0.40}
1,2,3-Trichlorobenzene	ug/kg	--	--	--	<2.1 {<1.0}	<1.9 {<0.96}	<2.2 {<1.1}	<2.0 {<1.0}
1,2,3-Trichloropropane	ug/kg	--	--	--	<2.1 {<1.0}	<1.9 {<0.96}	<2.2 {<1.1}	<2.0 {<1.0}
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<2.1 {<1.0}	<1.9 {<0.96}	<2.2 {<1.1}	<2.0 {<1.0}
1,2,4-Trimethylbenzene	ug/kg	--	--	--	<1.0 {<0.80}	<0.96 {<0.75}	<1.1 {<0.84}	<1.0 {<0.78}
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	<10 {<1.5}	<9.6 {<1.4}	<11 {<1.6}	<10 {<1.5}
1,2-Dibromoethane (EDB)	ug/kg	--	--	--	<1.0 {<0.82}	<0.96 {<0.76}	<1.1 {<0.86}	<1.0 {<0.80}
1,2-Dichlorobenzene	ug/kg	--	--	--	<1.0 {<0.98}	<0.96 {<0.91}	<1.1 {<1.0}	<1.0 {<0.95}
1,2-Dichloroethane	ug/kg	--	--	10,000	<1.0 {<0.82}	<0.96 {<0.76}	<1.1 {<0.86}	<1.0 {<0.80}
1,2-Dichloropropane	ug/kg	--	--	--	<1.0 {<0.82}	<0.96 {<0.76}	<1.1 {<0.86}	<1.0 {<0.80}
1,3,5-Trimethylbenzene	ug/kg	--	--	--	<1.0 {<0.65}	<0.96 {<0.60}	<1.1 {<0.68}	<1.0 {<0.63}
1,3-Dichlorobenzene	ug/kg	--	--	--	<1.0 {<0.87}	<0.96 {<0.80}	<1.1 {<0.90}	<1.0 {<0.84}
1,3-Dichloropropane	ug/kg	--	--	--	<1.0 {<0.65}	<0.96 {<0.60}	<1.1 {<0.68}	<1.0 {<0.63}
1,4-Dichlorobenzene	ug/kg	--	--	--	<1.0 {<0.97}	<0.96 {<0.90}	<1.1 {<1.0}	<1.0 {<0.94}
2,2-Dichloropropane	ug/kg	--	--	--	<1.0 {<0.62}	<0.96 {<0.57}	<1.1 {<0.65}	<1.0 {<0.60}
2-Butanone (MEK)	ug/kg	--	--	4,000,000	<10 {<6.2}	<9.6 {<5.7}	<11 {<6.5}	<10 {<6.0}
2-Chlorotoluene	ug/kg	--	--	--	<2.1 {<0.90}	<1.9 {<0.83}	<2.2 {<0.94}	<2.0 {<0.87}
2-Hexanone	ug/kg	--	--	--	<10 {<9.4}	<9.6 {<8.7}	<11 {<9.8}	<10 {<9.1}
4-Chlorotoluene	ug/kg	--	--	--	<2.1 {<0.76}	<1.9 {<0.71}	<2.2 {<0.80}	<2.0 {<0.74}
4-Methyl-2-pentanone (MIBK)	ug/kg	--	--	--	<5.2 {<4.6}	<4.8 {<4.3}	<5.4 {<4.8}	<5.0 {<4.5}
Acetone	ug/kg	--	--	--	<10 {<8.2}	<9.6 {<7.6}	<11 {<8.6}	<10 {<8.0}
Benzene	ug/kg	--	--	10,000	<1.0 {<0.52}	<0.96 {<0.48}	<1.1 {<0.54}	<1.0 {<0.50}
Bromobenzene	ug/kg	--	--	--	<2.1 {<0.87}	<1.9 {<0.80}	<2.2 {<0.90}	<2.0 {<0.84}
Bromochloromethane	ug/kg	--	--	--	<2.1 {<0.93}	<1.9 {<0.86}	<2.2 {<0.97}	<2.0 {<0.90}
Bromodichloromethane	ug/kg	--	--	--	<1.0 {<0.52}	<0.96 {<0.48}	<1.1 {<0.54}	<1.0 {<0.50}
Bromoform	ug/kg	--	--	--	<2.1 {<0.82}	<1.9 {<0.76}	<2.2 {<0.86}	<2.0 {<0.80}
Bromomethane	ug/kg	--	--	--	<2.1 {<0.95}	<1.9 {<0.88}	<2.2 {<0.99}	<2.0 {<0.92}
Carbon Disulfide	ug/kg	--	--	--	<5.2 {<1.0}	<4.8 {<0.93}	<5.4 {<1.0}	<5.0 {<0.97}
Carbon tetrachloride	ug/kg	--	--	10,000	<2.1 {<0.52}	<1.9 {<0.48}	<2.2 {<0.54}	<2.0 {<0.50}
Chlorobenzene	ug/kg	--	--	2,000,000	<1.0 {<0.54}	<0.96 {<0.50}	<1.1 {<0.56}	<1.0 {<0.52}
Chloroethane	ug/kg	--	--	--	<2.1 {<1.5}	<1.9 {<1.4}	<2.2 {<1.6}	<2.0 {<1.5}
Chloroform	ug/kg	--	--	120,000	<1.0 {<0.52}	<0.96 {<0.48}	<1.1 {<0.54}	<1.0 {<0.50}
Chloromethane	ug/kg	--	--	--	<2.1 {<1.0}	<1.9 {<0.96}	<2.2 {<1.1}	<2.0 {<1.0}
cis-1,2-Dichloroethene	ug/kg	--	--	--	<1.0 {<0.86}	<0.96 {<0.79}	<1.1 {<0.89}	<1.0 {<0.83}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

					Object Name:	APWC0801	APWC0802	APWC0803	APWC0804
					Sample Name:	APWC0801S001	APWC0802S001	APWC0803S001	APWC0804S001
					Collection Date:	7/28/2010	7/28/2010	7/28/2010	7/28/2010
					Sample Depth (feet):	0.5 - 1.0	0.5 - 0.75	0.5 - 1.0	0.5 - 1.0
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
cis-1,3-Dichloropropene	ug/kg	--	--	--	<1.0 {<0.45}	<0.96 {<0.42}	<1.1 {<0.47}	<1.0 {<0.44}	
Dibromochloromethane	ug/kg	--	--	--	<1.0 {<0.72}	<0.96 {<0.67}	<1.1 {<0.75}	<1.0 {<0.70}	
Dibromomethane	ug/kg	--	--	--	<1.0 {<0.93}	<0.96 {<0.86}	<1.1 {<0.97}	<1.0 {<0.90}	
Dichlorodifluoromethane	ug/kg	--	--	--	<5.2 {<1.5}	<4.8 {<1.4}	<5.4 {<1.6}	<5.0 {<1.5}	
Ethylbenzene	ug/kg	--	--	--	<1.0 {<0.52}	<0.96 {<0.48}	<1.1 {<0.54}	<1.0 {<0.50}	
Hexachlorobutadiene	ug/kg	--	--	--	<2.1 {<0.82}	<1.9 {<0.76}	<2.2 {<0.86}	<2.0 {<0.80}	
Isopropylbenzene	ug/kg	--	--	--	<1.0 {<0.56}	<0.96 {<0.52}	<1.1 {<0.58}	<1.0 {<0.54}	
m,p-Xylenes	ug/kg	--	--	--	<2.1 {<0.82}	<1.9 {<0.76}	<2.2 {<0.86}	<2.0 {<0.80}	
Methylene chloride	ug/kg	--	--	--	<10 {<6.7}	<9.6 {<6.2}	<11 {<7.0}	<10 {<6.5}	
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	<2.1 {<1.0}	<1.9 {<0.96}	<2.2 {<1.1}	<2.0 {<1.0}	
n-Butylbenzene	ug/kg	--	--	--	<2.1 {<0.74}	<1.9 {<0.69}	<2.2 {<0.77}	<2.0 {<0.72}	
n-Propylbenzene	ug/kg	--	--	--	<1.0 {<0.63}	<0.96 {<0.58}	<1.1 {<0.66}	<1.0 {<0.61}	
Naphthalene	ug/kg	--	--	--	<2.1 {<1.1}	<1.9 {<1.1}	<2.2 {<1.2}	<2.0 {<1.1}	
o-Xylene	ug/kg	--	--	--	<1.0 {<0.52}	<0.96 {<0.48}	<1.1 {<0.54}	<1.0 {<0.50}	
p-Isopropyltoluene	ug/kg	--	--	--	<1.0 {<0.74}	<0.96 {<0.69}	<1.1 {<0.77}	<1.0 {<0.72}	
sec-Butylbenzene	ug/kg	--	--	--	<2.1 {<0.69}	<1.9 {<0.64}	<2.2 {<0.72}	<2.0 {<0.67}	
Styrene	ug/kg	--	--	--	<1.0 {<0.60}	<0.96 {<0.55}	<1.1 {<0.62}	<1.0 {<0.58}	
tert-Butylbenzene	ug/kg	--	--	--	<2.1 {<0.64}	<1.9 {<0.59}	<2.2 {<0.67}	<2.0 {<0.62}	
Tetrachloroethene	ug/kg	--	--	14,000	<1.0 {<0.51}	<0.96 {<0.47}	<1.1 {<0.53}	<1.0 {<0.49}	
Toluene	ug/kg	--	--	--	<1.0 {<0.52}	<0.96 {<0.48}	<1.1 {<0.54}	<1.0 {<0.50}	
trans-1,2-Dichloroethene	ug/kg	--	--	--	<1.0 {<0.72}	<0.96 {<0.67}	<1.1 {<0.75}	<1.0 {<0.70}	
trans-1,3-Dichloropropene	ug/kg	--	--	--	<1.0 {<0.63}	<0.96 {<0.58}	<1.1 {<0.66}	<1.0 {<0.61}	
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	<1.0 {<0.52}	<0.96 {<0.48}	<1.1 {<0.54}	<1.0 {<0.50}	
Trichlorofluoromethane	ug/kg	--	--	--	<2.1 {<0.56}	<1.9 {<0.52}	<2.2 {<0.58}	<2.0 {<0.54}	
Vinyl acetate	ug/kg	--	--	--	<5.2 {<2.6}	<4.8 {<2.4}	<5.4 {<2.7}	<5.0 {<2.5}	
Vinyl chloride	ug/kg	--	--	4,000	<2.1 {<0.94}	<1.9 {<0.87}	<2.2 {<0.98}	<2.0 {<0.91}	
RADIONUCLIDES	--	--	--	--	R	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

B - Analyte was detected in the associated method blank

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.

M1 - The MS and/or MSD were above the acceptance limits due to sample matrix interference. 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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

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

**ISRA 009 – AP/STP-1A.
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of the 4 samples taken at the ISRA Outfall 009, AP/STP-1A area. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹.

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 ~0.043 pCi/g respectively. Minimum detectable activity for tritium averaged ~0.51 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.

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.

Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from AP/STP-1A does not exceed the local background for Cs-137. The incremental dose from Cs-137 above background is therefore zero mrem/y. All but one Cs-137 results are non-detect. The highest Cs-137 result is 0.208 +/- 0.0452 pCi/g which is statistically equivalent to the highest

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 (Effective January 1, 2007) - <http://epa-prgs.ornl.gov/radionuclides/>.

background result of 0.213 +/- 0.04 pCi/g. The highest non-background subtracted Cs-137 result is equivalent to an effective dose of 0.19 mrem/y⁶.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from AP/STP-1A does not exceed the local background for Sr-90. The incremental dose from Sr-90 above background is therefore zero mrem/y. All Sr-90 results are non-detect. The highest Sr-90 result is 0.04 pCi/g which is non-detect and less than the highest background result of 0.13 pCi/g. The highest non-background subtracted, non-detect Sr-90 result is equivalent to an effective dose of 0.0024 mrem/y⁶.

Tritium - All tritium results are non-detect, the average tritium result is 0.062 pCi/g and the highest tritium result is 0.186 pCi/g. The highest non-detected, non-background subtracted tritium result is equivalent to an effective dose of 0.040 mrem/y⁶.

This waste is certified to be “radiologically” acceptable for shipment to, and disposal at, any waste disposal facility. The waste requires no further radiological controls.

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 AP/STP-1A 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 complies with the requirements of D-62-02. Verification sampling and/or approval by the

⁶ EPA dose compliance considerations for radionuclides (Effective August 3, 2010) - <http://epa-dccs.ornl.gov/>. Soil concentrations that meet the 10⁻⁶ residential risk PRG are < 0.5 mrem/y. The Cs-137 residential PRG of 0.0597 pCi/g is equivalent to 0.056 mrem/y. The Sr-90 residential PRG of 0.231 pCi/g is equivalent to 0.014 mrem/y. The tritium residential PRG of 2.28 pCi/g is equivalent to 0.486 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 8 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>

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

Soil Data from ISRA 009 - AP/STP-1A

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	APWC0801S001	N/A	7/28/2010	257424	-0.0262	0.0301	0.0475	NDA	0.0325	0.0295	0.048	NDA	0.097	0.282	0.499	NDA
2	APWC0802S001	N/A	7/28/2010	257424	0.208	0.0452	0.0385		0.0399	0.0303	0.0487	NDA	0.186	0.301	0.518	NDA
3	APWC0803S001	N/A	7/28/2010	257424	3.81E-05	0.026	0.0455	NDA	0.0141	0.0173	0.0294	NDA	-0.0686	0.272	0.51	NDA
4	APWC0804S001	N/A	7/28/2010	257424	-0.000851	0.0262	0.0457	NDA	-0.00424	0.0233	0.0472	NDA	0.0317	0.293	0.53	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	0.045	0.044			0.021	0.043			0.062	0.514		
Maximum	0.208	0.048			0.040	0.049			0.186	0.530		
Minimum	-0.026	0.039			-0.004	0.029			-0.069	0.499		
Count			4				4				4	
Number of Non-Detects			3				4				4	
% Non-Detects			75%				100%				100%	

Soil Data from ISRA 009 - AP/STP-1A

Wilcoxon Rank Sum Test -- (Cesium-137)

General Information:

The Wilcoxon Rank Sum method 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 by more than the DCGL.

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background by more than the DCGL.

How to use this template:

- 1) Enter analysis results in Data Tab.
- 2) The Wilcoxon Rank Sum test is prescribed in, NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

Derived Concentration Guideline Level, DCGL (pCi/g)	0.00
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:	4
z-value for alpha	1.645
No. of groups of tied measurements, g	10
Critical Value (excluding ties)	1478.8
Critical Value (including ties)	1478.7
Sum of Reference Ranks	1481.0
Sum of Survey Ranks	59.0
Sum of All Ranks	1540
Check Rank Sum $(n+m)*(n+m+1)/2$	1540

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	0.045
Max	0.213	0.208
Min	0.015	-0.026
σ	0.062	0.109
$m-1.96\sigma$	-0.035	-0.169
$m+1.96\sigma$	0.210	0.259

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1		0.092	0.092	R	31	31
2		0.020	0.020	R	10	10
3		0.020	0.020	R	10	10
4		0.100	0.100	R	35.5	35.5
5		0.020	0.020	R	10	10
6		0.158	0.158	R	46.5	46.5
7		0.175	0.175	R	48	48
8		0.209	0.209	R	54	54
9		0.180	0.180	R	49	49
10		0.030	0.030	R	18	18
11		0.213	0.213	R	55	55
12		0.025	0.025	R	15	15
13		0.020	0.020	R	10	10
14		0.020	0.020	R	10	10
15		0.074	0.074	R	27	27
16		0.147	0.147	R	42	42
17		0.100	0.100	R	35.5	35.5

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
18		0.067	0.067	R	25.5	25.5
19		0.099	0.099	R	34	34
20		0.101	0.101	R	37	37
21		0.148	0.148	R	43	43
22		0.153	0.153	R	45	45
23		0.025	0.025	R	15	15
24		0.188	0.188	R	50	50
25		0.198	0.198	R	52	52
26		0.030	0.030	R	18	18
27		0.079	0.079	R	28	28
28		0.158	0.158	R	46.5	46.5
29		0.109	0.109	R	38	38
30		0.059	0.059	R	24	24
31		0.067	0.067	R	25.5	25.5
32		0.113	0.113	R	39	39
33		0.015	0.015	R	5	5
34		0.031	0.031	R	20	20
35		0.042	0.042	R	23	23
36		0.097	0.097	R	32.5	32.5
37		0.015	0.015	R	5	5
38		0.020	0.020	R	10	10
39		0.085	0.085	R	30	30
40		0.080	0.080	R	29	29
41		0.015	0.015	R	5	5
42		0.020	0.020	R	10	10
43		0.035	0.035	R	21.5	21.5
44		0.035	0.035	R	21.5	21.5
45		0.025	0.025	R	15	15
46		0.150	0.150	R	44	44
47		0.140	0.140	R	40.5	40.5
48		0.190	0.190	R	51	51
49		0.097	0.097	R	32.5	32.5
50		0.030	0.030	R	18	18
51		0.140	0.140	R	40.5	40.5
52	APWC0801S001	-0.026	-0.026	S	1	0
53	APWC0802S001	0.208	0.208	S	53	0
54	APWC0803S001	0.000	0.000	S	3	0
55	APWC0804S001	-0.001	-0.001	S	2	0
Sum					1540.0	1481.0

Soil Data from ISRA 009 - AP/STP-1A

Wilcoxon Rank Sum Test -- (Strontium-90)

General Information:

The Wilcoxon Rank Sum method 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 by more than the DCGL.

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background by more than the DCGL.

How to use this template:

- 1) Enter analysis results in Data Tab.
- 2) The Wilcoxon Rank Sum test is prescribed in, NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

Derived Concentration Guideline Level, DCGL (pCi/g)	0.00
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:	4
z-value for alpha	1.645
No. of groups of tied measurements, g	9
Critical Value (excluding ties)	1478.8
Critical Value (including ties)	1478.4
Sum of Reference Ranks	1499.0
Sum of Survey Ranks	41.0
Sum of All Ranks	1540
Check Rank Sum $(n+m)*(n+m+1)/2$	1540

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	0.021
Max	0.130	0.040
Min	0.005	-0.004
σ	0.030	0.020
$m-1.96*\sigma$	-0.008	-0.018
$m+1.96*\sigma$	0.109	0.059

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1		0.030	0.030	R	14	14
2		0.010	0.010	R	3.5	3.5
3		0.045	0.045	R	30.5	30.5
4		0.045	0.045	R	30.5	30.5
5		0.050	0.050	R	40	40
6		0.040	0.040	R	22	22
7		0.035	0.035	R	17.5	17.5
8		0.050	0.050	R	40	40
9		0.050	0.050	R	40	40
10		0.130	0.130	R	54.5	54.5
11		0.120	0.120	R	53	53
12		0.040	0.040	R	22	22
13		0.045	0.045	R	30.5	30.5
14		0.130	0.130	R	54.5	54.5
15		0.050	0.050	R	40	40
16		0.088	0.088	R	48	48
17		0.080	0.080	R	45	45











No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
18		0.100	0.100	R	52	52
19		0.069	0.069	R	44	44
20		0.097	0.097	R	50	50
21		0.084	0.084	R	47	47
22		0.098	0.098	R	51	51
23		0.045	0.045	R	30.5	30.5
24		0.045	0.045	R	30.5	30.5
25		0.020	0.020	R	8	8
26		0.045	0.045	R	30.5	30.5
27		0.089	0.089	R	49	49
28		0.050	0.050	R	40	40
29		0.045	0.045	R	30.5	30.5
30		0.050	0.050	R	40	40
31		0.045	0.045	R	30.5	30.5
32		0.040	0.040	R	22	22
33		0.045	0.045	R	30.5	30.5
34		0.045	0.045	R	30.5	30.5
35		0.045	0.045	R	30.5	30.5
36		0.025	0.025	R	11.5	11.5
37		0.082	0.082	R	46	46
38		0.045	0.045	R	30.5	30.5
39		0.040	0.040	R	22	22
40		0.035	0.035	R	17.5	17.5
41		0.025	0.025	R	11.5	11.5
42		0.005	0.005	R	2	2
43		0.020	0.020	R	8	8
44		0.010	0.010	R	3.5	3.5
45		0.020	0.020	R	8	8
46		0.020	0.020	R	8	8
47		0.050	0.050	R	40	40
48		0.030	0.030	R	14	14
49		0.030	0.030	R	14	14
50		0.020	0.020	R	8	8
51		0.040	0.040	R	22	22
52	APWC0801S001	0.033	0.033	S	16	0
53	APWC0802S001	0.040	0.040	S	19	0
54	APWC0803S001	0.014	0.014	S	5	0
55	APWC0804S001	-0.004	-0.004	S	1	0
Sum					1540.0	1499.0


Appendix 2
Radionuclide Results

ISRA Outfall 009 - AP/STP 1A

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
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Americium-241	-0.00799	0.0333	0.0535	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Americium-241	-0.068	0.0837	0.157	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Americium-241	0.0961	0.123	0.222	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Americium-241	0.0808	0.115	0.22	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Cesium-134	0	0.0587	0.0677	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Cesium-134	0	0.0359	0.052	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Cesium-134	0.0395	0.0371	0.0653	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Cesium-134	0.0536	0.0609	0.0691	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Cesium-137	-0.0262	0.0301	0.0475	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Cesium-137	0.208	0.0452	0.0385	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Cesium-137	3.81E-05	0.026	0.0455	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Cesium-137	-0.000851	0.0262	0.0457	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Cobalt-60	-0.0103	0.0324	0.054	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Cobalt-60	-0.00655	0.022	0.0368	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Cobalt-60	-0.0012	0.0274	0.046	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Cobalt-60	0.00819	0.0289	0.0503	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Europium-152	-0.0571	0.0575	0.0986	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Europium-152	0.0545	0.0863	0.0991	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Europium-152	-0.092	0.0736	0.111	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Europium-152	-0.00442	0.0805	0.124	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Europium-154	-0.0016	0.102	0.177	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Europium-154	0.0103	0.0706	0.123	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Europium-154	-0.0292	0.0922	0.152	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Europium-154	0.00413	0.092	0.157	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Manganese-54	0.014	0.0273	0.0489	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Manganese-54	0.0392	0.0232	0.0426	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Manganese-54	-0.00274	0.0267	0.0452	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Manganese-54	0.00779	0.0273	0.0474	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Potassium-40	25.4	2.55	0.409	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Potassium-40	23	2.23	0.384	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Potassium-40	23.4	2.48	0.337	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Potassium-40	23.4	2.53	0.359	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Sodium-22	-0.00118	0.0359	0.0619	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Sodium-22	0.00932	0.0246	0.0434	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Sodium-22	-0.0105	0.0324	0.0535	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Sodium-22	9.59E-06	0.0325	0.0553	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Strontium-90	0.0325	0.0295	0.048	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Strontium-90	0.0399	0.0303	0.0487	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Strontium-90	0.0141	0.0173	0.0294	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Strontium-90	-0.00424	0.0233	0.0472	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Thorium-228	1.43	0.154	0.0547	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Thorium-228	1.35	0.144	0.059	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Thorium-228	1.26	0.175	0.0698	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Thorium-228	1.44	0.166	0.0707	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Thorium-232	1.5	0.3	0.181	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Thorium-232	1.24	0.233	0.136	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Thorium-232	1.34	0.267	0.176	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Thorium-232	1.41	0.283	0.181	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Tritium	0.097	0.282	0.499	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Tritium	0.186	0.301	0.518	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Tritium	-0.0686	0.272	0.51	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Tritium	0.0317	0.293	0.53	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Uranium-235	-0.00077	0.104	0.189	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Uranium-235	0.0315	0.12	0.215	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Uranium-235	0.00708	0.144	0.253	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Uranium-235	0.00282	0.15	0.258	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0801	APWC0801S001	Soil	Uranium-238	1.18	0.572	0.535	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0802	APWC0802S001	Soil	Uranium-238	0.539	0.752	1.42	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0803	APWC0803S001	Soil	Uranium-238	1.49	1.5	1.7	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP 1A	APWC0804	APWC0804S001	Soil	Uranium-238	0.974	0.983	1.86	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257424	Waste

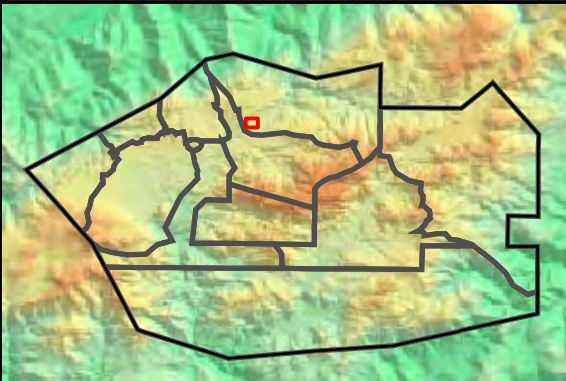
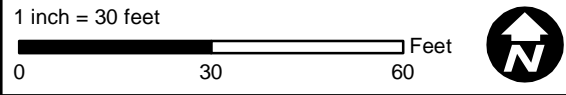
Outfall 009
Sample Locations for AP/STP - 1A

- Base Map Legend**
-  Administrative Area Boundary
 -  RFI Site Boundary
 -  Report Group Boundary
 -  NPDES Outfall
 -  Dirt Road
 -  A/C Paving
 -  Drainage
 -  Non Jurisdictional Surface Water Pathway
 -  Surface Water Divide
 -  Elevation Contour

- Figure Legend**
-  Waste Characterization Sample



Document: ISRA_Plots_SP_RD47_SampleLocations_060710.mxd Date: Jun 22, 2010



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

FIGURE X

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT AREA II ISRA OUTFALL 009 PLANNED EXCAVATION AP/STP-1D

Introduction

This report presents supporting detailed information for the July 28 and 29, 2010 in-situ characterization sampling of prospective soil wastes from planned SSFL Area II ISRA excavations in the vicinity of the former Area II incinerator.

Background

In-situ characterization was performed for soil destined to be excavated from designated locations in SSFL Area II in accordance with the ISRA Workplan. 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 or near planned excavation sites. The objective was to identify all substances potentially impacting the soil in each planned excavation footprint to the degree that hazardous waste regulatory thresholds would be exceeded.

The next step was to develop and implement a random sampling plan for each of the planned excavation footprints. The collected soil samples were analyzed by a state certified laboratory and the results evaluated to determine whether any of the identified substances were present at concentrations requiring further investigation. In addition, the initial random sampling results were evaluated to determine the statistical adequacy of the data provided for waste characterization based on the guidelines presented in U.S. EPA SW-846. 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 in lieu of further testing, the soil was summarily characterized as hazardous. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation AP/STP-1D was based partly on the Group 2 RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals (CAM17), Volatile Organic Compounds (VOC), Polychlorinated Biphenyls (PCB), and Petroleum Hydrocarbons should be addressed in the AP/STP-1D excavation footprint. A random sampling plan was developed for collection of five (5) samples from the planned excavation footprint, taking into account the relatively small area to be excavated. The samples were analyzed for CAM 17 metals, VOCs, PCBs, and Petroleum Hydrocarbons. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the planned excavation area at AP/STP-1D are presented in Test America reports ITG2542 issued on 8/4/10 and ITG2663 issued on 8/6/10. Only very low concentrations of Regulated Metals were detected in any of the samples from AP/STP-1D. All of the detected Regulated Metals were well below 10-Times their respective California Soluble Threshold Limits (STLC) and no further testing was required.

No VOCs were detected in any of the samples, while Method Detection Limits (MDL) for all analytes were no higher than the low parts per billion range (ppb). Although PCBs, in the form of Aroclors 1254 and 1260 were detected in one sample, the concentrations were only slightly above the laboratory analysis detection capability and could not be measured precisely. The estimated concentrations were 0.014 ppm and 0.012 ppm, well below the 50 ppm 10X STLC hazardous waste threshold. Petroleum Hydrocarbons were detected at very low levels, with a maximum concentration in the C10-C40 range of 18 ppm.











Determination


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

- Is Not a Listed Waste (analytical results and 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 characteristic thresholds
 - Is Not subject to the Prop. 65 listing if it is applied to 22 CCR 66261.24(a)(7)
 - 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.

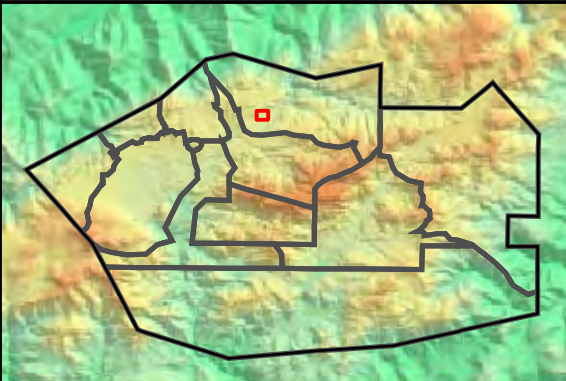
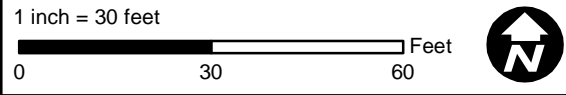
The soil in AP/STP-1D is NON-HAZARDOUS.

Outfall 009
Sample Locations for AP/STP - 1D

- Base Map Legend**
-  Administrative Area Boundary
 -  RFI Site Boundary
 -  Report Group Boundary
 -  NPDES Outfall
 -  Dirt Road
 -  A/C Paving
 -  Drainage
 -  Non Jurisdictional Surface Water Pathway
 -  Surface Water Divide
 -  Elevation Contour

- Figure Legend**
-  Waste Characterization Sample

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SANTA SUSANA FIELD LABORATORY

FIGURE X

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1D
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:		APWC0301	APWC0302	APWC0303	APWC0304	APWC0305
			Sample Name:		APWC0301S001	APWC0302S001	APWC0303S001	APWC0304S001	APWC0305S001
			Collection Date:		7/28/2010	7/29/2010	7/28/2010	7/28/2010	7/29/2010
			Sample Depth (feet):		0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
METALS									
Antimony	mg/kg	500	150	--	1.2 J	0.98 J	0.98 J	1.5 J	1.2 J
Arsenic	mg/kg	500	50	100	4.3	6.6	4.1	6.8	4.5
Barium	mg/kg	10,000	1,000	2,000	100	63	74	62	100
Beryllium	mg/kg	75	7.5	--	0.53	0.68	0.43 J	0.57	0.51
Cadmium	mg/kg	100	10	20	<0.20	<0.20	<0.20	<0.20	<0.20
Chromium	mg/kg	500	50	100	21	17	17	16	19
Cobalt	mg/kg	8,000	800	--	5.0	4.4	3.9	4.4	5.3
Copper	mg/kg	2,500	250	--	12	7.5	10	7.3	11
Lead	mg/kg	1,000	50	100	5.5	5.8	9.2	6.1	6.1
Mercury	mg/kg	20	2	4	0.014 J	<0.012	<0.012	<0.012	<0.012
Molybdenum	mg/kg	3,500	3,500	--	0.71 J	0.75 J	0.57 J	0.68 J	0.81 J
Nickel	mg/kg	2,000	200	--	13	9	9.9	8.7	13
Selenium	mg/kg	100	10	20	<0.99	<0.99	<0.99	<1	<0.99
Silver	mg/kg	500	50	100	<0.79	<0.79	1.5	<0.8	<0.79
Thallium	mg/kg	700	70	--	<0.79	<0.79	<0.79	<0.8	<0.79
Vanadium	mg/kg	2,400	240	--	34	31	26	30	34
Zinc	mg/kg	5,000	2,500	--	55 B	39	45 B	42 B	58
PCBs									
Aroclor 1016	ug/kg	50,000	50,000	--	<12 {<50}	<50 {<12}	<12 {<50}	<12 {<50}	<50 {<12}
Aroclor 1221	ug/kg	50,000	50,000	--	<12 {<50}	<50 {<12}	<12 {<50}	<12 {<50}	<50 {<12}
Aroclor 1232	ug/kg	50,000	50,000	--	<12 {<50}	<50 {<12}	<12 {<50}	<12 {<50}	<50 {<12}
Aroclor 1242	ug/kg	50,000	50,000	--	<12 {<50}	<50 {<12}	<12 {<50}	<12 {<50}	<50 {<12}
Aroclor 1248	ug/kg	50,000	50,000	--	<12 {<50}	<50 {<12}	<12 {<50}	<12 {<50}	<50 {<12}
Aroclor 1254	ug/kg	50,000	50,000	--	<12 {<50}	<50 {<12}	14 J	<12 {<50}	<50 {<12}
Aroclor 1260	ug/kg	50,000	50,000	--	<12 {<50}	<50 {<12}	12 J	<12 {<50}	<50 {<12}
TPH									
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	<0.15 {<0.39}	<0.4 {<0.15}	<0.14 {<0.37}	<0.18 {<0.48}	<0.45 {<0.17}
EFH (C10 - C24)	mg/kg	--	--	--	<4.7 {<6.7}	<5 {<3.5}	6.0 J	<2.3 {<3.3}	<5 {<3.5}
EFH (C10 - C40)	mg/kg	--	--	--	5.8 J	6.3	18	8.5	3.6 J
EFH (C25 - C40)	mg/kg	--	--	--	<4.7 {<6.7}	5.3	12	7.0	<5 {<3.5}
VOCs									
1,1,1,2-Tetrachloroethane	ug/kg	--	--	--	<0.57 {<2.0}	<2 {<0.57}	<0.58 {<2.0}	<0.57 {<2.0}	<2 {<0.56}
1,1,1-Trichloroethane	ug/kg	--	--	--	<0.71 {<1.0}	<1 {<0.7}	<0.72 {<1.0}	<0.70 {<1.0}	<0.99 {<0.69}
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	<0.87 {<2.0}	<2 {<0.86}	<0.88 {<2.0}	<0.86 {<2.0}	<2 {<0.85}
1,1,2-Trichloroethane	ug/kg	--	--	--	<0.88 {<1.0}	<1 {<0.87}	<0.89 {<1.0}	<0.87 {<1.0}	<0.99 {<0.86}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1D
 THE BOEING COMPANY
 SANTA SUSANA FIELD LABORATORY

ANALYTE	UNITS	TTLIC	Object Name:		APWC0301	APWC0302	APWC0303	APWC0304	APWC0305
			WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	APWC0301S001	APWC0302S001	APWC0303S001	APWC0304S001	APWC0305S001
					7/28/2010	7/29/2010	7/28/2010	7/28/2010	7/29/2010
					0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
Object Name:	Sample Name:	Collection Date:	Sample Depth (feet):	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
1,1-Dichloroethane	ug/kg	--	--	--	<0.50 {<1.0}	<1 {<0.5}	<0.51 {<1.0}	<0.50 {<1.0}	<0.99 {<0.5}
1,1-Dichloroethene	ug/kg	--	--	14,000	<0.60 {<2.0}	<2 {<0.6}	<0.61 {<2.0}	<0.60 {<2.0}	<2 {<0.59}
1,1-Dichloropropene	ug/kg	--	--	--	<0.40 {<1.0}	<1 {<0.4}	<0.41 {<1.0}	<0.40 {<1.0}	<0.99 {<0.4}
1,2,3-Trichlorobenzene	ug/kg	--	--	--	<1.0 {<2.0}	<2 {<1}	<1.0 {<2.0}	<1.0 {<2.0}	<2 {<0.99}
1,2,3-Trichloropropane	ug/kg	--	--	--	<1.0 {<2.0}	<2 {<1}	<1.0 {<2.0}	<1.0 {<2.0}	<2 {<0.99}
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<1.0 {<2.0}	<2 {<1}	<1.0 {<2.0}	<1.0 {<2.0}	<2 {<0.99}
1,2,4-Trimethylbenzene	ug/kg	--	--	--	<0.79 {<1.0}	<1 {<0.78}	<0.80 {<1.0}	<0.78 {<1.0}	<0.99 {<0.77}
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	<1.5 {<10}	<10 {<1.5}	<1.5 {<10}	<1.5 {<10}	<9.9 {<1.5}
1,2-Dibromoethane (EDB)	ug/kg	--	--	--	<0.81 {<1.0}	<1 {<0.8}	<0.82 {<1.0}	<0.80 {<1.0}	<0.99 {<0.79}
1,2-Dichlorobenzene	ug/kg	--	--	--	<0.96 {<1.0}	<1 {<0.95}	<0.97 {<1.0}	<0.95 {<1.0}	<0.99 {<0.94}
1,2-Dichloroethane	ug/kg	--	--	10,000	<0.81 {<1.0}	<1 {<0.8}	<0.82 {<1.0}	<0.80 {<1.0}	<0.99 {<0.79}
1,2-Dichloropropane	ug/kg	--	--	--	<0.81 {<1.0}	<1 {<0.8}	<0.82 {<1.0}	<0.80 {<1.0}	<0.99 {<0.79}
1,3,5-Trimethylbenzene	ug/kg	--	--	--	<0.64 {<1.0}	<1 {<0.63}	<0.64 {<1.0}	<0.63 {<1.0}	<0.99 {<0.62}
1,3-Dichlorobenzene	ug/kg	--	--	--	<0.85 {<1.0}	<1 {<0.84}	<0.86 {<1.0}	<0.84 {<1.0}	<0.99 {<0.83}
1,3-Dichloropropane	ug/kg	--	--	--	<0.64 {<1.0}	<1 {<0.63}	<0.64 {<1.0}	<0.63 {<1.0}	<0.99 {<0.62}
1,4-Dichlorobenzene	ug/kg	--	--	--	<0.95 {<1.0}	<1 {<0.94}	<0.96 {<1.0}	<0.94 {<1.0}	<0.99 {<0.93}
2,2-Dichloropropane	ug/kg	--	--	--	<0.60 {<1.0}	<1 {<0.6}	<0.61 {<1.0}	<0.60 {<1.0}	<0.99 {<0.59}
2-Butanone (MEK)	ug/kg	--	--	4,000,000	<6.0 {<10}	<10 {<6}	<6.1 {<10}	<6.0 {<10}	<9.9 {<5.9}
2-Chlorotoluene	ug/kg	--	--	--	<0.88 {<2.0}	<2 {<0.87}	<0.89 {<2.0}	<0.87 {<2.0}	<2 {<0.86}
2-Hexanone	ug/kg	--	--	--	<9.2 {<10}	<10 {<9.1}	<9.3 {<10}	<9.1 {<10}	<9.9 {<9}
4-Chlorotoluene	ug/kg	--	--	--	<0.75 {<2.0}	<2 {<0.74}	<0.76 {<2.0}	<0.74 {<2.0}	<2 {<0.73}
4-Methyl-2-pentanone (MIBK)	ug/kg	--	--	--	<4.5 {<5.0}	<5 {<4.5}	<4.6 {<5.1}	<4.5 {<5.0}	<5 {<4.5}
Acetone	ug/kg	--	--	--	<8.1 {<10}	<10 {<8}	<8.2 {<10}	<8.0 {<10}	<9.9 {<7.9}
Benzene	ug/kg	--	--	10,000	<0.50 {<1.0}	<1 {<0.5}	<0.51 {<1.0}	<0.50 {<1.0}	<0.99 {<0.5}
Bromobenzene	ug/kg	--	--	--	<0.85 {<2.0}	<2 {<0.84}	<0.86 {<2.0}	<0.84 {<2.0}	<2 {<0.83}
Bromochloromethane	ug/kg	--	--	--	<0.91 {<2.0}	<2 {<0.9}	<0.92 {<2.0}	<0.90 {<2.0}	<2 {<0.89}
Bromodichloromethane	ug/kg	--	--	--	<0.50 {<1.0}	<1 {<0.5}	<0.51 {<1.0}	<0.50 {<1.0}	<0.99 {<0.5}
Bromoform	ug/kg	--	--	--	<0.81 {<2.0}	<2 {<0.8}	<0.82 {<2.0}	<0.80 {<2.0}	<2 {<0.79}
Bromomethane	ug/kg	--	--	--	<0.93 {<2.0}	<2 {<0.92}	<0.94 {<2.0}	<0.92 {<2.0}	<2 {<0.91}
Carbon Disulfide	ug/kg	--	--	--	<0.98 {<5.0}	<5 {<0.97}	<0.99 {<5.1}	<0.97 {<5.0}	<5 {<0.96}
Carbon tetrachloride	ug/kg	--	--	10,000	<0.50 {<2.0}	<2 {<0.5}	<0.51 {<2.0}	<0.50 {<2.0}	<2 {<0.5}
Chlorobenzene	ug/kg	--	--	2,000,000	<0.52 {<1.0}	<1 {<0.52}	<0.53 {<1.0}	<0.52 {<1.0}	<0.99 {<0.51}
Chloroethane	ug/kg	--	--	--	<1.5 {<2.0}	<2 {<1.5}	<1.5 {<2.0}	<1.5 {<2.0}	<2 {<1.5}
Chloroform	ug/kg	--	--	120,000	<0.50 {<1.0}	<1 {<0.5}	<0.51 {<1.0}	<0.50 {<1.0}	<0.99 {<0.5}
Chloromethane	ug/kg	--	--	--	<1.0 {<2.0}	<2 {<1}	<1.0 {<2.0}	<1.0 {<2.0}	<2 {<0.99}
cis-1,2-Dichloroethene	ug/kg	--	--	--	<0.84 {<1.0}	<1 {<0.83}	<0.85 {<1.0}	<0.83 {<1.0}	<0.99 {<0.82}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1D
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:		APWC0301	APWC0302	APWC0303	APWC0304	APWC0305
			Sample Name:		APWC0301S001	APWC0302S001	APWC0303S001	APWC0304S001	APWC0305S001
			Collection Date:		7/28/2010	7/29/2010	7/28/2010	7/28/2010	7/29/2010
			Sample Depth (feet):		0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
cis-1,3-Dichloropropene	ug/kg	--	--	--	<0.44 {<1.0}	<1 {<0.44}	<0.45 {<1.0}	<0.44 {<1.0}	<0.99 {<0.44}
Dibromochloromethane	ug/kg	--	--	--	<0.71 {<1.0}	<1 {<0.7}	<0.72 {<1.0}	<0.70 {<1.0}	<0.99 {<0.69}
Dibromomethane	ug/kg	--	--	--	<0.91 {<1.0}	<1 {<0.9}	<0.92 {<1.0}	<0.90 {<1.0}	<0.99 {<0.89}
Dichlorodifluoromethane	ug/kg	--	--	--	<1.5 {<5.0}	<5 {<1.5}	<1.5 {<5.1}	<1.5 {<5.0}	<5 {<1.5}
Ethylbenzene	ug/kg	--	--	--	<0.50 {<1.0}	<1 {<0.5}	<0.51 {<1.0}	<0.50 {<1.0}	<0.99 {<0.5}
Hexachlorobutadiene	ug/kg	--	--	--	<0.81 {<2.0}	<2 {<0.8}	<0.82 {<2.0}	<0.80 {<2.0}	<2 {<0.79}
Isopropylbenzene	ug/kg	--	--	--	<0.54 {<1.0}	<1 {<0.54}	<0.55 {<1.0}	<0.54 {<1.0}	<0.99 {<0.53}
m,p-Xylenes	ug/kg	--	--	--	<0.81 {<2.0}	<2 {<0.8}	<0.82 {<2.0}	<0.80 {<2.0}	<2 {<0.79}
Methylene chloride	ug/kg	--	--	--	<6.6 {<10}	<10 {<6.5}	<6.6 {<10}	<6.5 {<10}	<9.9 {<6.4}
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	<1.0 {<2.0}	<2 {<1}	<1.0 {<2.0}	<1.0 {<2.0}	<2 {<0.99}
n-Butylbenzene	ug/kg	--	--	--	<0.73 {<2.0}	<2 {<0.72}	<0.74 {<2.0}	<0.72 {<2.0}	<2 {<0.71}
n-Propylbenzene	ug/kg	--	--	--	<0.61 {<1.0}	<1 {<0.61}	<0.62 {<1.0}	<0.61 {<1.0}	<0.99 {<0.6}
Naphthalene	ug/kg	--	--	--	<1.1 {<2.0}	<2 {<1.1}	<1.1 {<2.0}	<1.1 {<2.0}	<2 {<1.1}
o-Xylene	ug/kg	--	--	--	<0.50 {<1.0}	<1 {<0.5}	<0.51 {<1.0}	<0.50 {<1.0}	<0.99 {<0.5}
p-Isopropyltoluene	ug/kg	--	--	--	<0.73 {<1.0}	<1 {<0.72}	<0.74 {<1.0}	<0.72 {<1.0}	<0.99 {<0.71}
sec-Butylbenzene	ug/kg	--	--	--	<0.68 {<2.0}	<2 {<0.67}	<0.69 {<2.0}	<0.67 {<2.0}	<2 {<0.66}
Styrene	ug/kg	--	--	--	<0.58 {<1.0}	<1 {<0.58}	<0.59 {<1.0}	<0.58 {<1.0}	<0.99 {<0.57}
tert-Butylbenzene	ug/kg	--	--	--	<0.62 {<2.0}	<2 {<0.62}	<0.63 {<2.0}	<0.62 {<2.0}	<2 {<0.61}
Tetrachloroethene	ug/kg	--	--	14,000	<0.49 {<1.0}	<1 {<0.49}	<0.50 {<1.0}	<0.49 {<1.0}	<0.99 {<0.49}
Toluene	ug/kg	--	--	--	<0.50 {<1.0}	<1 {<0.5}	<0.51 {<1.0}	<0.50 {<1.0}	<0.99 {<0.5}
trans-1,2-Dichloroethene	ug/kg	--	--	--	<0.71 {<1.0}	<1 {<0.7}	<0.72 {<1.0}	<0.70 {<1.0}	<0.99 {<0.69}
trans-1,3-Dichloropropene	ug/kg	--	--	--	<0.61 {<1.0}	<1 {<0.61}	<0.62 {<1.0}	<0.61 {<1.0}	<0.99 {<0.6}
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	<0.50 {<1.0}	<1 {<0.5}	<0.51 {<1.0}	<0.50 {<1.0}	<0.99 {<0.5}
Trichlorofluoromethane	ug/kg	--	--	--	<0.54 {<2.0}	<2 {<0.54}	<0.55 {<2.0}	<0.54 {<2.0}	<2 {<0.53}
Vinyl acetate	ug/kg	--	--	--	<2.5 {<5.0}	<5 {<2.5}	<2.6 {<5.1}	<2.5 {<5.0}	<5 {<2.5}
Vinyl chloride	ug/kg	--	--	4,000	<0.92 {<2.0}	<2 {<0.91}	<0.93 {<2.0}	<0.91 {<2.0}	<2 {<0.9}
RADIONUCLIDES	--	--	--	--	R	R	R	R	R

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

B - Analyte was detected in the associated method blank

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.

M1 - The MS and/or MSD were above the acceptance limits due to sample matrix interference. 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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

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

**ISRA 009 – AP/STP-1D.
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of the 5 samples taken at the ISRA Outfall 009, AP/STP-1D area. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹.

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 ~0.043 pCi/g and ~0.048 pCi/g respectively. Minimum detectable activity for tritium averaged ~0.61 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.

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.

Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from AP/STP-1D 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 0.137 pCi/g

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 (Effective January 1, 2007) - <http://epa-prgs.ornl.gov/radionuclides/>.

which is less than the highest background result of 0.213 pCi/g. The highest non-background subtracted Cs-137 result is equivalent to an effective dose of 0.13 mrem/y⁶.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from AP/STP-1D does not exceed the local background for Sr-90. The incremental dose from Sr-90 above background is therefore zero mrem/y. All Sr-90 results are non-detect. The highest Sr-90 result is 0.048 pCi/g which is non-detect and less than the highest background result of 0.13 pCi/g. The highest non-background subtracted, non-detect Sr-90 result is equivalent to an effective dose of 0.0028 mrem/y⁶.

Tritium - All tritium results are non-detect, the average tritium result is -0.034 pCi/g and the highest tritium result is 0.134 pCi/g. The highest non-detected, non-background subtracted tritium result is equivalent to an effective dose of 0.029 mrem/y⁶.

This waste is certified to be “radiologically” acceptable for shipment to, and disposal at, any waste disposal facility. The waste requires no further radiological controls.

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 AP/STP-1D 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 complies with the requirements of D-62-02. Verification sampling and/or approval by the

⁶ EPA dose compliance considerations for radionuclides (Effective August 3, 2010) - <http://epa-dccs.ornl.gov/>. Soil concentrations that meet the 10⁻⁶ residential risk PRG are < 0.5 mrem/y. The Cs-137 residential PRG of 0.0597 pCi/g is equivalent to 0.056 mrem/y. The Sr-90 residential PRG of 0.231 pCi/g is equivalent to 0.014 mrem/y. The tritium residential PRG of 2.28 pCi/g is equivalent to 0.486 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 8 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>

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

Soil Data from ISRA 009 - AP/STP-1D

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	APWC0301S001	N/A	7/28/2010	257427	-0.00265	0.022	0.0388	NDA	0.0477	0.0313	0.0482	NDA	-0.0159	0.289	0.532	NDA
2	APWC0302S001	N/A	7/29/2010	257559	0.137	0.0447	0.0425		0.0298	0.0291	0.047	NDA	-0.233	0.353	0.719	NDA
3	APWC0303S001	N/A	7/28/2010	257427	0.00525	0.0222	0.0388	NDA	0.0401	0.0299	0.0483	NDA	0.0608	0.284	0.509	NDA
4	APWC0304S001	N/A	7/28/2010	257427	0.0213	0.025	0.0462	NDA	0.00878	0.0272	0.0491	NDA	0.134	0.301	0.526	NDA
5	APWC0305S001	N/A	7/29/2010	257559	0.0526	0.0358	0.0497		0.0201	0.0273	0.0463	NDA	-0.114	0.384	0.746	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	0.043		0.043		0.029		0.048		-0.034		0.606	
Maximum	0.137		0.050		0.048		0.049		0.134		0.746	
Minimum	-0.003		0.039		0.009		0.046		-0.233		0.509	
Count				5				5				5
Number of Non-Detects				3				5				5
% Non-Detects				60%				100%				100%

Soil Data from ISRA 009 - AP/STP-1D

Wilcoxon Rank Sum Test -- (Cesium-137)

General Information:

The Wilcoxon Rank Sum method 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 by more than the DCGL.

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background by more than the DCGL.

How to use this template:

- 1) Enter analysis results in Data Tab.
- 2) The Wilcoxon Rank Sum test is prescribed in, NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

Derived Concentration Guideline Level, DCGL (pCi/g)	0.00
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:	5
z-value for alpha	1.645
No. of groups of tied measurements, g	10
Critical Value (excluding ties)	1510.7
Critical Value (including ties)	1510.7
Sum of Reference Ranks	1515.0
Sum of Survey Ranks	81.0
Sum of All Ranks	1596
Check Rank Sum $(n+m)*(n+m+1)/2$	1596

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	0.043
Max	0.213	0.137
Min	0.015	-0.003
σ	0.062	0.057
$m-1.96*\sigma$	-0.035	-0.069
$m+1.96*\sigma$	0.210	0.154

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1		0.092	0.092	R	32	32
2		0.020	0.020	R	9	9
3		0.020	0.020	R	9	9
4		0.100	0.100	R	36.5	36.5
5		0.020	0.020	R	9	9
6		0.158	0.158	R	48.5	48.5
7		0.175	0.175	R	50	50
8		0.209	0.209	R	55	55
9		0.180	0.180	R	51	51
10		0.030	0.030	R	18	18
11		0.213	0.213	R	56	56
12		0.025	0.025	R	15	15
13		0.020	0.020	R	9	9
14		0.020	0.020	R	9	9
15		0.074	0.074	R	28	28
16		0.147	0.147	R	44	44
17		0.100	0.100	R	36.5	36.5

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
18		0.067	0.067	R	26.5	26.5
19		0.099	0.099	R	35	35
20		0.101	0.101	R	38	38
21		0.148	0.148	R	45	45
22		0.153	0.153	R	47	47
23		0.025	0.025	R	15	15
24		0.188	0.188	R	52	52
25		0.198	0.198	R	54	54
26		0.030	0.030	R	18	18
27		0.079	0.079	R	29	29
28		0.158	0.158	R	48.5	48.5
29		0.109	0.109	R	39	39
30		0.059	0.059	R	25	25
31		0.067	0.067	R	26.5	26.5
32		0.113	0.113	R	40	40
33		0.015	0.015	R	4	4
34		0.031	0.031	R	20	20
35		0.042	0.042	R	23	23
36		0.097	0.097	R	33.5	33.5
37		0.015	0.015	R	4	4
38		0.020	0.020	R	9	9
39		0.085	0.085	R	31	31
40		0.080	0.080	R	30	30
41		0.015	0.015	R	4	4
42		0.020	0.020	R	9	9
43		0.035	0.035	R	21.5	21.5
44		0.035	0.035	R	21.5	21.5
45		0.025	0.025	R	15	15
46		0.150	0.150	R	46	46
47		0.140	0.140	R	42.5	42.5
48		0.190	0.190	R	53	53
49		0.097	0.097	R	33.5	33.5
50		0.030	0.030	R	18	18
51		0.140	0.140	R	42.5	42.5
52	APWC0301S001	-0.003	-0.003	S	1	0
53	APWC0302S001	0.137	0.137	S	41	0
54	APWC0303S001	0.005	0.005	S	2	0
55	APWC0304S001	0.021	0.021	S	13	0
56	APWC0305S001	0.053	0.053	S	24	0
Sum					1596.0	1515.0

Soil Data from ISRA 009 - AP/STP-1D
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Wilcoxon Rank Sum Test -- (Strontium-90)**General Information:**

The Wilcoxon Rank Sum method 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 by more than the DCGL.

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background by more than the DCGL.

How to use this template:

- 1) Enter analysis results in Data Tab.
- 2) The Wilcoxon Rank Sum test is prescribed in, NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

Derived Concentration Guideline Level, DCGL (pCi/g)	0.0001
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:	5
z-value for alpha	1.645
No. of groups of tied measurements, g	9
Critical Value (excluding ties)	1510.7
Critical Value (including ties)	1510.3
Sum of Reference Ranks	1515.0
Sum of Survey Ranks	81.0
Sum of All Ranks	1596
Check Rank Sum $(n+m)*(n+m+1)/2$	1596

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	0.029
Max	0.130	0.048
Min	0.005	0.009
σ	0.030	0.016
$m-1.96*\sigma$	-0.008	-0.001
$m+1.96*\sigma$	0.109	0.060

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1		0.030	0.030	R	15	15
2		0.010	0.010	R	3.5	3.5
3		0.045	0.045	R	30.5	30.5
4		0.045	0.045	R	30.5	30.5
5		0.050	0.050	R	41	41
6		0.040	0.040	R	21.5	21.5
7		0.035	0.035	R	17.5	17.5
8		0.050	0.050	R	41	41
9		0.050	0.050	R	41	41
10		0.130	0.130	R	55.5	55.5
11		0.120	0.120	R	54	54
12		0.040	0.040	R	21.5	21.5
13		0.045	0.045	R	30.5	30.5
14		0.130	0.130	R	55.5	55.5
15		0.050	0.050	R	41	41
16		0.088	0.088	R	49	49
17		0.080	0.080	R	46	46

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
18		0.100	0.100	R	53	53
19		0.069	0.069	R	45	45
20		0.097	0.097	R	51	51
21		0.084	0.084	R	48	48
22		0.098	0.098	R	52	52
23		0.045	0.045	R	30.5	30.5
24		0.045	0.045	R	30.5	30.5
25		0.020	0.020	R	7.5	7.5
26		0.045	0.045	R	30.5	30.5
27		0.089	0.089	R	50	50
28		0.050	0.050	R	41	41
29		0.045	0.045	R	30.5	30.5
30		0.050	0.050	R	41	41
31		0.045	0.045	R	30.5	30.5
32		0.040	0.040	R	21.5	21.5
33		0.045	0.045	R	30.5	30.5
34		0.045	0.045	R	30.5	30.5
35		0.045	0.045	R	30.5	30.5
36		0.025	0.025	R	11.5	11.5
37		0.082	0.082	R	47	47
38		0.045	0.045	R	30.5	30.5
39		0.040	0.040	R	21.5	21.5
40		0.035	0.035	R	17.5	17.5
41		0.025	0.025	R	11.5	11.5
42		0.005	0.005	R	1	1
43		0.020	0.020	R	7.5	7.5
44		0.010	0.010	R	3.5	3.5
45		0.020	0.020	R	7.5	7.5
46		0.020	0.020	R	7.5	7.5
47		0.050	0.050	R	41	41
48		0.030	0.030	R	15	15
49		0.030	0.030	R	15	15
50		0.020	0.020	R	7.5	7.5
51		0.040	0.040	R	21.5	21.5
52	APWC0301S001	0.048	0.048	S	37	0
53	APWC0302S001	0.030	0.030	S	13	0
54	APWC0303S001	0.040	0.040	S	21.5	0
55	APWC0304S001	0.009	0.009	S	2	0
56	APWC0305S001	0.020	0.020	S	7.5	0
Sum					1596.0	1515.0



Appendix 2
Radionuclide Results

ISRA Outfall 009 - AP/STP-1D

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
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Americium-241	0.028	0.149	0.258	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Americium-241	-0.0138	0.109	0.204	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Americium-241	-0.0243	0.0701	0.115	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Americium-241	0.00976	0.0903	0.172	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Americium-241	-0.0304	0.0703	0.116	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Cesium-134	0	0.0383	0.0547	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Cesium-134	0	0.0496	0.0654	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Cesium-134	0	0.0345	0.0515	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Cesium-134	0	0.0453	0.0578	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Cesium-134	0	0.0409	0.0595	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Cesium-137	-0.00265	0.022	0.0388	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Cesium-137	0.137	0.0447	0.0425	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Cesium-137	0.00525	0.0222	0.0388	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Cesium-137	0.0213	0.025	0.0462	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Cesium-137	0.0526	0.0358	0.0497	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Cobalt-60	-0.000923	0.0263	0.0451	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Cobalt-60	-0.00714	0.024	0.0403	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Cobalt-60	-0.00375	0.0236	0.039	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Cobalt-60	-0.0155	0.0241	0.0382	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Cobalt-60	-0.007	0.0265	0.0438	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Europium-152	-0.0112	0.0589	0.103	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Europium-152	-0.0268	0.0972	0.115	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Europium-152	-0.00591	0.0596	0.0966	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Europium-152	0.0106	0.0647	0.102	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Europium-152	-0.00976	0.0711	0.109	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Europium-154	0.0186	0.0839	0.148	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Europium-154	-0.0127	0.0844	0.145	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Europium-154	-0.0336	0.0787	0.128	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Europium-154	0.0458	0.0777	0.139	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Europium-154	0.0969	0.0846	0.156	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Manganese-54	-0.0112	0.0241	0.0402	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Manganese-54	-0.0111	0.0242	0.0408	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Manganese-54	0.0271	0.0231	0.0394	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Manganese-54	0.0242	0.0229	0.0421	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Manganese-54	0.00303	0.0256	0.0442	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Potassium-40	23.2	2.44	0.326	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Potassium-40	22.8	2.67	0.355	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Potassium-40	24.1	2.34	0.302	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Potassium-40	21	2.16	0.326	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Potassium-40	23.6	2.38	0.361	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Sodium-22	0.00885	0.0291	0.0516	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Sodium-22	-0.004	0.0297	0.0511	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Sodium-22	-0.0121	0.0277	0.045	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Sodium-22	0.0149	0.0272	0.0487	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Sodium-22	0.0296	0.0299	0.0548	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Strontium-90	0.0477	0.0313	0.0482	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Strontium-90	0.0298	0.0291	0.047	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Strontium-90	0.0401	0.0299	0.0483	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Strontium-90	0.00878	0.0272	0.0491	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Strontium-90	0.0201	0.0273	0.0463	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Thorium-228	1.18	0.142	0.064	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Thorium-228	1.26	0.144	0.0682	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Thorium-228	1.26	0.185	0.0544	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Thorium-228	1.3	0.142	0.0629	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Thorium-228	1.21	0.139	0.0612	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Thorium-232	1.24	0.249	0.141	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Thorium-232	1.33	0.271	0.163	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Thorium-232	1.15	0.223	0.126	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Thorium-232	1.28	0.247	0.147	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Thorium-232	1.18	0.257	0.159	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Tritium	-0.0159	0.289	0.532	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Tritium	-0.233	0.353	0.719	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257559	Waste

ISRA Outfall 009 - AP/STP-1D

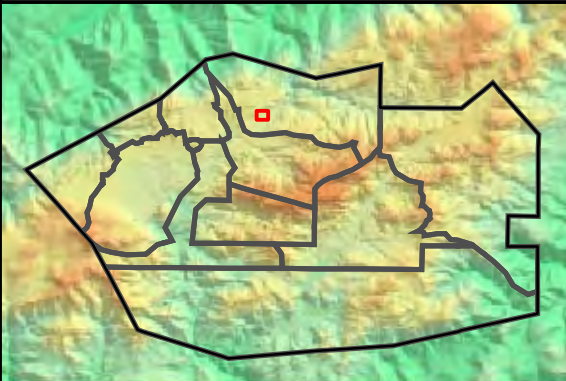
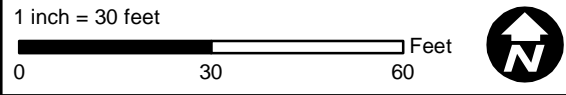
Project Name	Sampling Organization	Sampling Date	Sampling Location (General)	Sampling Location (Specific)	Sample Serial Number	Media Type	Isotope	Value	Error (+/-)	MDA	Non-Detect?	Units	Error Type	Analysis Protocol	Analysis Organization	Document	Status
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Tritium	0.134	0.301	0.526	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Tritium	-0.114	0.384	0.746	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Uranium-235	0.0732	0.126	0.225	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Uranium-235	-0.000692	0.152	0.265	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Uranium-235	0.0397	0.108	0.197	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Uranium-235	0.126	0.136	0.24	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Uranium-235	-0.0453	0.13	0.22	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0301	APWC0301S001	Soil	Uranium-238	1.36	1.43	1.99	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0302	APWC0302S001	Soil	Uranium-238	-0.0454	0.984	1.8	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0303	APWC0303S001	Soil	Uranium-238	1.18	1.06	1.03		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/28/2010	AP/STP-1D	APWC0304	APWC0304S001	Soil	Uranium-238	0.276	0.834	1.6	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257427	Waste
2010 ISRA Waste Characterization	MWH	7/29/2010	AP/STP-1D	APWC0305	APWC0305S001	Soil	Uranium-238	1.72	1.06	1.05		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257559	Waste

Outfall 009
Sample Locations for AP/STP - 1D

- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - Dirt Road
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Figure Legend**
- ▲ Waste Characterization Sample

Document: ISRA_Plots_SP_RD47_SampleLocations_060710.mxd Date: Jun 22, 2010



SANTA SUSANA FIELD LABORATORY

FIGURE X

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT AREA II ISRA OUTFALL 009 PLANNED EXCAVATION AP/STP-1F

Introduction

This report presents supporting detailed information for the July 30, 2010 in-situ characterization sampling of prospective soil wastes from planned SSFL Area II ISRA excavations in the vicinity of the former Area II incinerator.

Background

In-situ characterization was performed for soil destined to be excavated from designated locations in SSFL Area II in accordance with the ISRA Workplan. 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 or near planned excavation sites. The objective was to identify all substances potentially impacting the soil in each planned excavation footprint to the degree that hazardous waste regulatory thresholds would be exceeded.

The next step was to develop and implement a random sampling plan for each of the planned excavation footprints. The collected soil samples were analyzed by a state certified laboratory and the results evaluated to determine whether any of the identified substances were present at concentrations requiring further investigation. In addition, the initial random sampling results were evaluated to determine the statistical adequacy of the data provided for waste characterization based on the guidelines presented in U.S. EPA SW-846. 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 in lieu of further testing, the soil was summarily characterized as hazardous. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation AP/STP-1F was based partly on the Group 2 RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals (CAM17), Volatile Organic Compounds (VOC), Polychlorinated Biphenyls (PCB), and Petroleum Hydrocarbons should be addressed in the AP/STP-1F 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 CAM 17 metals, VOCs, PCBs, and Petroleum Hydrocarbons. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the planned excavation area at AP/STP-1F are presented in Test America report ITG2803 issued on 8/6/10. Only very low concentrations of Regulated Metals were detected in any of the samples from AP/STP-1F. All of the detected Regulated Metals were well below 10-Times their respective California Soluble Threshold Limits (STLC) and no further testing was required.

No VOCs or PCBs were detected in any of the samples, while Method Detection Limits (MDL) for all analytes were no higher than the low parts per billion range (ppb). Petroleum Hydrocarbons were detected at very low levels, with a maximum concentration in the C10-C40 range of 21 ppm.

Determination

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

- Is Not a Listed Waste (analytical results and 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 characteristic thresholds
 - Is Not subject to the Prop. 65 listing if it is applied to 22 CCR 66261.24(a)(7)
 - 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 AP/STP-1F is NON-HAZARDOUS.

Outfall 009
Sample Locations for AP/STP - 1F

Base Map Legend








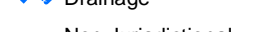
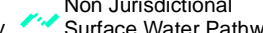
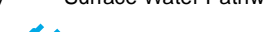

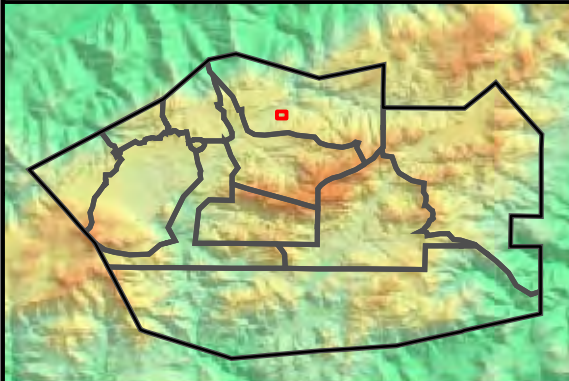
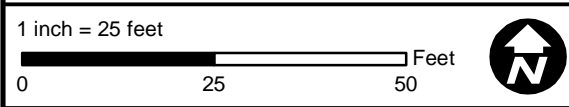
-  Administrative Area Boundary
-  RFI Site Boundary
-  Report Group Boundary
-  NPDES Outfall
-  Dirt Road
-  A/C Paving
-  Drainage
-  Non Jurisdictional Surface Water Pathway
-  Surface Water Divide
-  Elevation Contour

Figure Legend

-  Waste Characterization Sample



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INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1F
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	APWC0701	APWC0702	APWC0703	APWC0704
				Sample Name:	APWC0701S001	APWC0702S001	APWC0703S001	APWC0704S001
				Collection Date:	7/30/2010	7/30/2010	7/30/2010	7/30/2010
				Sample Depth (feet):	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
ANALYTE	UNITS	TTLc	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
METALS								
Antimony	mg/kg	500	150	--	0.99 J	0.87 J	<0.87	<0.87
Arsenic	mg/kg	500	50	100	7.6	4.9	5	4.6
Barium	mg/kg	10,000	1,000	2,000	91	92	110	75
Beryllium	mg/kg	75	7.5	--	0.64	0.61	0.62	0.55
Cadmium	mg/kg	100	10	20	<0.20	<0.20	<0.20	<0.20
Chromium	mg/kg	500	50	100	17	18	20	15
Cobalt	mg/kg	8,000	800	--	4.5	5	5.4	4
Copper	mg/kg	2,500	250	--	9.1	10	10	8
Lead	mg/kg	1,000	50	100	8.6	6.2	8.4	7.6
Mercury	mg/kg	20	2	4	0.018 J	<0.012	0.015 J	<0.012
Molybdenum	mg/kg	3,500	3,500	--	0.81 J	0.73 J	0.81 J	0.61 J
Nickel	mg/kg	2,000	200	--	9.7	10	11	8.4
Selenium	mg/kg	100	10	20	<0.99	<0.99	<0.99	<0.99
Silver	mg/kg	500	50	100	<0.79	<0.79	<0.79	0.79 J
Thallium	mg/kg	700	70	--	<0.79	<0.79	<0.79	<0.79
Vanadium	mg/kg	2,400	240	--	34	37	41	28
Zinc	mg/kg	5,000	2,500	--	49 B	48 B	58 B	42 B
PCBs								
Aroclor 1016	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1221	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1232	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1242	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1248	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1254	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1260	ug/kg	50,000	50,000	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
TPH								
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	<0.32 {<0.12}	<0.39 {<0.15}	<0.45 {<0.17}	<0.42 {<0.16}
EFH (C10 - C24)	mg/kg	--	--	--	<5 {<3.5}	<5 {<3.5}	<5 {<3.5}	<5 {<3.5}
EFH (C10 - C40)	mg/kg	--	--	--	9.2	<5 {<3.5}	21	7
EFH (C25 - C40)	mg/kg	--	--	--	7.8	<5 {<3.5}	20	5.4
VOCs								
1,1,1,2-Tetrachloroethane	ug/kg	--	--	--	<1.9 {<0.55}	<2 {<0.57}	<2.2 {<0.62}	<1.9 {<0.55}
1,1,1-Trichloroethane	ug/kg	--	--	--	<0.97 {<0.68}	<1 {<0.7}	<1.1 {<0.77}	<0.97 {<0.68}
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	<1.9 {<0.83}	<2 {<0.86}	<2.2 {<0.94}	<1.9 {<0.84}
1,1,2-Trichloroethane	ug/kg	--	--	--	<0.97 {<0.84}	<1 {<0.87}	<1.1 {<0.95}	<0.97 {<0.85}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1F
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	APWC0701	APWC0702	APWC0703	APWC0704
				Sample Name:	APWC0701S001	APWC0702S001	APWC0703S001	APWC0704S001
				Collection Date:	7/30/2010	7/30/2010	7/30/2010	7/30/2010
				Sample Depth (feet):	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
1,1-Dichloroethane	ug/kg	--	--	--	<0.97 {<0.48}	<1 {<0.5}	<1.1 {<0.55}	<0.97 {<0.49}
1,1-Dichloroethene	ug/kg	--	--	14,000	<1.9 {<0.58}	<2 {<0.6}	<2.2 {<0.66}	<1.9 {<0.58}
1,1-Dichloropropene	ug/kg	--	--	--	<0.97 {<0.39}	<1 {<0.4}	<1.1 {<0.44}	<0.97 {<0.39}
1,2,3-Trichlorobenzene	ug/kg	--	--	--	<1.9 {<0.97}	<2 {<1}	<2.2 {<1.1}	<1.9 {<0.97}
1,2,3-Trichloropropane	ug/kg	--	--	--	<1.9 {<0.97}	<2 {<1}	<2.2 {<1.1}	<1.9 {<0.97}
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<1.9 {<0.97}	<2 {<1}	<2.2 {<1.1}	<1.9 {<0.97}
1,2,4-Trimethylbenzene	ug/kg	--	--	--	<0.97 {<0.76}	<1 {<0.78}	<1.1 {<0.86}	<0.97 {<0.76}
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	<9.7 {<1.5}	<10 {<1.5}	<11 {<1.6}	<9.7 {<1.5}
1,2-Dibromoethane (EDB)	ug/kg	--	--	--	<0.97 {<0.78}	<1 {<0.8}	<1.1 {<0.88}	<0.97 {<0.78}
1,2-Dichlorobenzene	ug/kg	--	--	--	<0.97 {<0.92}	<1 {<0.95}	<1.1 {<1}	<0.97 {<0.92}
1,2-Dichloroethane	ug/kg	--	--	10,000	<0.97 {<0.78}	<1 {<0.8}	<1.1 {<0.88}	<0.97 {<0.78}
1,2-Dichloropropane	ug/kg	--	--	--	<0.97 {<0.78}	<1 {<0.8}	<1.1 {<0.88}	<0.97 {<0.78}
1,3,5-Trimethylbenzene	ug/kg	--	--	--	<0.97 {<0.61}	<1 {<0.63}	<1.1 {<0.69}	<0.97 {<0.61}
1,3-Dichlorobenzene	ug/kg	--	--	--	<0.97 {<0.81}	<1 {<0.84}	<1.1 {<0.92}	<0.97 {<0.82}
1,3-Dichloropropane	ug/kg	--	--	--	<0.97 {<0.61}	<1 {<0.63}	<1.1 {<0.69}	<0.97 {<0.61}
1,4-Dichlorobenzene	ug/kg	--	--	--	<0.97 {<0.91}	<1 {<0.94}	<1.1 {<1}	<0.97 {<0.91}
2,2-Dichloropropane	ug/kg	--	--	--	<0.97 {<0.58}	<1 {<0.6}	<1.1 {<0.66}	<0.97 {<0.58}
2-Butanone (MEK)	ug/kg	--	--	4,000,000	<9.7 {<5.8}	<10 {<6}	<11 {<6.6}	<9.7 {<5.8}
2-Chlorotoluene	ug/kg	--	--	--	<1.9 {<0.84}	<2 {<0.87}	<2.2 {<0.95}	<1.9 {<0.85}
2-Hexanone	ug/kg	--	--	--	<9.7 {<8.8}	<10 {<9.1}	<11 {<10}	<9.7 {<8.9}
4-Chlorotoluene	ug/kg	--	--	--	<1.9 {<0.72}	<2 {<0.74}	<2.2 {<0.81}	<1.9 {<0.72}
4-Methyl-2-pentanone (MIBK)	ug/kg	--	--	--	<4.8 {<4.4}	<5 {<4.5}	<5.5 {<4.9}	<4.9 {<4.4}
Acetone	ug/kg	--	--	--	<9.7 {<7.8}	<10 {<8}	<11 {<8.8}	<9.7 {<7.8}
Benzene	ug/kg	--	--	10,000	<0.97 {<0.48}	<1 {<0.5}	<1.1 {<0.55}	<0.97 {<0.49}
Bromobenzene	ug/kg	--	--	--	<1.9 {<0.81}	<2 {<0.84}	<2.2 {<0.92}	<1.9 {<0.82}
Bromochloromethane	ug/kg	--	--	--	<1.9 {<0.87}	<2 {<0.9}	<2.2 {<0.99}	<1.9 {<0.88}
Bromodichloromethane	ug/kg	--	--	--	<0.97 {<0.48}	<1 {<0.5}	<1.1 {<0.55}	<0.97 {<0.49}
Bromoform	ug/kg	--	--	--	<1.9 {<0.78}	<2 {<0.8}	<2.2 {<0.88}	<1.9 {<0.78}
Bromomethane	ug/kg	--	--	--	<1.9 {<0.89}	<2 {<0.92}	<2.2 {<1}	<1.9 {<0.89}
Carbon Disulfide	ug/kg	--	--	--	<4.8 {<0.94}	<5 {<0.97}	<5.5 {<1.1}	<4.9 {<0.94}
Carbon tetrachloride	ug/kg	--	--	10,000	<1.9 {<0.48}	<2 {<0.5}	<2.2 {<0.55}	<1.9 {<0.49}
Chlorobenzene	ug/kg	--	--	2,000,000	<0.97 {<0.5}	<1 {<0.52}	<1.1 {<0.57}	<0.97 {<0.51}
Chloroethane	ug/kg	--	--	--	<1.9 {<1.5}	<2 {<1.5}	<2.2 {<1.6}	<1.9 {<1.5}
Chloroform	ug/kg	--	--	120,000	<0.97 {<0.48}	<1 {<0.5}	<1.1 {<0.55}	<0.97 {<0.49}
Chloromethane	ug/kg	--	--	--	<1.9 {<0.97}	<2 {<1}	<2.2 {<1.1}	<1.9 {<0.97}
cis-1,2-Dichloroethene	ug/kg	--	--	--	<0.97 {<0.8}	<1 {<0.83}	<1.1 {<0.91}	<0.97 {<0.81}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1F
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

					Object Name:	APWC0701	APWC0702	APWC0703	APWC0704
					Sample Name:	APWC0701S001	APWC0702S001	APWC0703S001	APWC0704S001
					Collection Date:	7/30/2010	7/30/2010	7/30/2010	7/30/2010
					Sample Depth (feet):	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
cis-1,3-Dichloropropene	ug/kg	--	--	--	<0.97 {<0.43}	<1 {<0.44}	<1.1 {<0.48}	<0.97 {<0.43}	
Dibromochloromethane	ug/kg	--	--	--	<0.97 {<0.68}	<1 {<0.7}	<1.1 {<0.77}	<0.97 {<0.68}	
Dibromomethane	ug/kg	--	--	--	<0.97 {<0.87}	<1 {<0.9}	<1.1 {<0.99}	<0.97 {<0.88}	
Dichlorodifluoromethane	ug/kg	--	--	--	<4.8 {<1.5}	<5 {<1.5}	<5.5 {<1.6}	<4.9 {<1.5}	
Ethylbenzene	ug/kg	--	--	--	<0.97 {<0.48}	<1 {<0.5}	<1.1 {<0.55}	<0.97 {<0.49}	
Hexachlorobutadiene	ug/kg	--	--	--	<1.9 {<0.78}	<2 {<0.8}	<2.2 {<0.88}	<1.9 {<0.78}	
Isopropylbenzene	ug/kg	--	--	--	<0.97 {<0.52}	<1 {<0.54}	<1.1 {<0.59}	<0.97 {<0.53}	
m,p-Xylenes	ug/kg	--	--	--	<1.9 {<0.78}	<2 {<0.8}	<2.2 {<0.88}	<1.9 {<0.78}	
Methylene chloride	ug/kg	--	--	--	<9.7 {<6.3}	<10 {<6.5}	<11 {<7.1}	<9.7 {<6.3}	
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	<1.9 {<0.97}	<2 {<1}	<2.2 {<1.1}	<1.9 {<0.97}	
n-Butylbenzene	ug/kg	--	--	--	<1.9 {<0.7}	<2 {<0.72}	<2.2 {<0.79}	<1.9 {<0.7}	
n-Propylbenzene	ug/kg	--	--	--	<0.97 {<0.59}	<1 {<0.61}	<1.1 {<0.67}	<0.97 {<0.59}	
Naphthalene	ug/kg	--	--	--	<1.9 {<1.1}	<2 {<1.1}	<2.2 {<1.2}	<1.9 {<1.1}	
o-Xylene	ug/kg	--	--	--	<0.97 {<0.48}	<1 {<0.5}	<1.1 {<0.55}	<0.97 {<0.49}	
p-Isopropyltoluene	ug/kg	--	--	--	<0.97 {<0.7}	<1 {<0.72}	<1.1 {<0.79}	<0.97 {<0.7}	
sec-Butylbenzene	ug/kg	--	--	--	<1.9 {<0.65}	<2 {<0.67}	<2.2 {<0.73}	<1.9 {<0.65}	
Styrene	ug/kg	--	--	--	<0.97 {<0.56}	<1 {<0.58}	<1.1 {<0.64}	<0.97 {<0.56}	
tert-Butylbenzene	ug/kg	--	--	--	<1.9 {<0.6}	<2 {<0.62}	<2.2 {<0.68}	<1.9 {<0.6}	
Tetrachloroethene	ug/kg	--	--	14,000	<0.97 {<0.47}	<1 {<0.49}	<1.1 {<0.54}	<0.97 {<0.48}	
Toluene	ug/kg	--	--	--	<0.97 {<0.48}	<1 {<0.5}	<1.1 {<0.55}	<0.97 {<0.49}	
trans-1,2-Dichloroethene	ug/kg	--	--	--	<0.97 {<0.68}	<1 {<0.7}	<1.1 {<0.77}	<0.97 {<0.68}	
trans-1,3-Dichloropropene	ug/kg	--	--	--	<0.97 {<0.59}	<1 {<0.61}	<1.1 {<0.67}	<0.97 {<0.59}	
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	<0.97 {<0.48}	<1 {<0.5}	<1.1 {<0.55}	<0.97 {<0.49}	
Trichlorofluoromethane	ug/kg	--	--	--	<1.9 {<0.52}	<2 {<0.54}	<2.2 {<0.59}	<1.9 {<0.53}	
Vinyl acetate	ug/kg	--	--	--	<4.8 {<2.4}	<5 {<2.5}	<5.5 {<2.7}	<4.9 {<2.4}	
Vinyl chloride	ug/kg	--	--	4,000	<1.9 {<0.88}	<2 {<0.91}	<2.2 {<1}	<1.9 {<0.89}	
RADIONUCLIDES	--	--	--	--	R	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

B - Analyte was detected in the associated method blank

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.

M1 - The MS and/or MSD were above the acceptance limits due to sample matrix interference. 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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

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

**ISRA 009 – AP/STP-1F.
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of the 4 samples taken at the ISRA Outfall 009, AP/STP-1F area. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹.

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 ~0.043 pCi/g and ~0.046 pCi/g respectively. Minimum detectable activity for tritium averaged ~1.0 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.

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.

Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from AP/STP-1F does not exceed the local background for Cs-137. The incremental dose from Cs-137 above background is therefore zero mrem/y. All but one Cs-137 results are non-detect. The highest Cs-137 result is 0.057 pCi/g which is less than the highest background result of

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 (Effective January 1, 2007) - <http://epa-prgs.ornl.gov/radionuclides/>.

0.213 pCi/g. The highest non-background subtracted Cs-137 result is equivalent to an effective dose of 0.053 mrem/y⁶.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from AP/STP-1F does not exceed the local background for Sr-90. The incremental dose from Sr-90 above background is therefore zero mrem/y. All Sr-90 results are non-detect. The highest Sr-90 result is 0.04 pCi/g which is non-detect and less than the highest background result of 0.13 pCi/g. The highest non-background subtracted, non-detect Sr-90 result is equivalent to an effective dose of 0.0024 mrem/y⁶.

Tritium - All tritium results are non-detect, the average tritium result is -0.008 pCi/g and the highest tritium result is 0.226 pCi/g. The highest non-detected, non-background subtracted tritium result is equivalent to an effective dose of 0.048 mrem/y⁶.

This waste is certified to be “radiologically” acceptable for shipment to, and disposal at, any waste disposal facility. The waste requires no further radiological controls.

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 AP/STP-1F 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 complies with the requirements of D-62-02. Verification sampling and/or approval by the

⁶ EPA dose compliance considerations for radionuclides (Effective August 3, 2010) - <http://epa-dccs.ornl.gov/>. Soil concentrations that meet the 10⁻⁶ residential risk PRG are < 0.5 mrem/y. The Cs-137 residential PRG of 0.0597 pCi/g is equivalent to 0.056 mrem/y. The Sr-90 residential PRG of 0.231 pCi/g is equivalent to 0.014 mrem/y. The tritium residential PRG of 2.28 pCi/g is equivalent to 0.486 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 8 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>

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

Soil Data from ISRA 009 - AP/STP-1F

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	APWC0701S001	N/A	7/30/2010	257647	0.0142	0.0218	0.0389	NDA	0.04	0.0284	0.0449	NDA	-0.0896	0.585	1.01	NDA
2	APWC0702S001	N/A	7/30/2010	257647	0.00096	0.0284	0.0502	NDA	0.0384	0.0292	0.0471	NDA	-0.212	0.579	1.01	NDA
3	APWC0703S001	N/A	7/30/2010	257647	-0.0215	0.0258	0.0426	NDA	-0.0156	0.0226	0.0464	NDA	0.226	0.599	1.02	NDA
4	APWC0704S001	N/A	7/30/2010	257647	0.0574	0.0375	0.0403		0.00242	0.0252	0.0461	NDA	0.0444	0.584	1.01	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	0.013	0.043			0.016	0.046			-0.008	1.013		
Maximum	0.057	0.050			0.040	0.047			0.226	1.020		
Minimum	-0.022	0.039			-0.016	0.045			-0.212	1.010		
Count			4				4				4	
Number of Non-Detects			3				4				4	
% Non-Detects			75%				100%				100%	

Soil Data from ISRA 009 - AP/STP-1F

Wilcoxon Rank Sum Test -- (Cesium-137)

General Information:

The Wilcoxon Rank Sum method 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 by more than the DCGL.

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background by more than the DCGL.

How to use this template:

- 1) Enter analysis results in Data Tab.
- 2) The Wilcoxon Rank Sum test is prescribed in, NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

Derived Concentration Guideline Level, DCGL (pCi/g)	0.00
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:	4
z-value for alpha	1.645
No. of groups of tied measurements, g	10
Critical Value (excluding ties)	1478.8
Critical Value (including ties)	1478.7
Sum of Reference Ranks	1510.0
Sum of Survey Ranks	30.0
Sum of All Ranks	1540
Check Rank Sum $(n+m)*(n+m+1)/2$	1540

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	0.013
Max	0.213	0.057
Min	0.015	-0.022
σ	0.062	0.033
$m-1.96*\sigma$	-0.035	-0.052
$m+1.96*\sigma$	0.210	0.078

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1		0.092	0.092	R	32	32
2		0.020	0.020	R	10	10
3		0.020	0.020	R	10	10
4		0.100	0.100	R	36.5	36.5
5		0.020	0.020	R	10	10
6		0.158	0.158	R	47.5	47.5
7		0.175	0.175	R	49	49
8		0.209	0.209	R	54	54
9		0.180	0.180	R	50	50
10		0.030	0.030	R	18	18
11		0.213	0.213	R	55	55
12		0.025	0.025	R	15	15
13		0.020	0.020	R	10	10
14		0.020	0.020	R	10	10
15		0.074	0.074	R	28	28
16		0.147	0.147	R	43	43
17		0.100	0.100	R	36.5	36.5

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
18		0.067	0.067	R	26.5	26.5
19		0.099	0.099	R	35	35
20		0.101	0.101	R	38	38
21		0.148	0.148	R	44	44
22		0.153	0.153	R	46	46
23		0.025	0.025	R	15	15
24		0.188	0.188	R	51	51
25		0.198	0.198	R	53	53
26		0.030	0.030	R	18	18
27		0.079	0.079	R	29	29
28		0.158	0.158	R	47.5	47.5
29		0.109	0.109	R	39	39
30		0.059	0.059	R	25	25
31		0.067	0.067	R	26.5	26.5
32		0.113	0.113	R	40	40
33		0.015	0.015	R	5	5
34		0.031	0.031	R	20	20
35		0.042	0.042	R	23	23
36		0.097	0.097	R	33.5	33.5
37		0.015	0.015	R	5	5
38		0.020	0.020	R	10	10
39		0.085	0.085	R	31	31
40		0.080	0.080	R	30	30
41		0.015	0.015	R	5	5
42		0.020	0.020	R	10	10
43		0.035	0.035	R	21.5	21.5
44		0.035	0.035	R	21.5	21.5
45		0.025	0.025	R	15	15
46		0.150	0.150	R	45	45
47		0.140	0.140	R	41.5	41.5
48		0.190	0.190	R	52	52
49		0.097	0.097	R	33.5	33.5
50		0.030	0.030	R	18	18
51		0.140	0.140	R	41.5	41.5
52	APWC0701S001	0.014	0.014	S	3	0
53	APWC0702S001	0.001	0.001	S	2	0
54	APWC0703S001	-0.022	-0.022	S	1	0
55	APWC0704S001	0.057	0.057	S	24	0
Sum					1540.0	1510.0

Soil Data from ISRA 009 - AP/STP-1F

Wilcoxon Rank Sum Test -- (Strontium-90)

General Information:

The Wilcoxon Rank Sum method 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 by more than the DCGL.

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background by more than the DCGL.

How to use this template:

- 1) Enter analysis results in Data Tab.
- 2) The Wilcoxon Rank Sum test is prescribed in, NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

Derived Concentration Guideline Level, DCGL (pCi/g)	0.00
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:	4
z-value for alpha	1.645
No. of groups of tied measurements, g	9
Critical Value (excluding ties)	1478.8
Critical Value (including ties)	1478.4
Sum of Reference Ranks	1497.5
Sum of Survey Ranks	42.5
Sum of All Ranks	1540
Check Rank Sum $(n+m)*(n+m+1)/2$	1540

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	0.016
Max	0.130	0.040
Min	0.005	-0.016
σ	0.030	0.027
$m-1.96*\sigma$	-0.008	-0.037
$m+1.96*\sigma$	0.109	0.070

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1		0.030	0.030	R	14	14
2		0.010	0.010	R	4.5	4.5
3		0.045	0.045	R	30.5	30.5
4		0.045	0.045	R	30.5	30.5
5		0.050	0.050	R	40	40
6		0.040	0.040	R	21.5	21.5
7		0.035	0.035	R	16.5	16.5
8		0.050	0.050	R	40	40
9		0.050	0.050	R	40	40
10		0.130	0.130	R	54.5	54.5
11		0.120	0.120	R	53	53
12		0.040	0.040	R	21.5	21.5
13		0.045	0.045	R	30.5	30.5
14		0.130	0.130	R	54.5	54.5
15		0.050	0.050	R	40	40
16		0.088	0.088	R	48	48
17		0.080	0.080	R	45	45

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
18		0.100	0.100	R	52	52
19		0.069	0.069	R	44	44
20		0.097	0.097	R	50	50
21		0.084	0.084	R	47	47
22		0.098	0.098	R	51	51
23		0.045	0.045	R	30.5	30.5
24		0.045	0.045	R	30.5	30.5
25		0.020	0.020	R	8	8
26		0.045	0.045	R	30.5	30.5
27		0.089	0.089	R	49	49
28		0.050	0.050	R	40	40
29		0.045	0.045	R	30.5	30.5
30		0.050	0.050	R	40	40
31		0.045	0.045	R	30.5	30.5
32		0.040	0.040	R	21.5	21.5
33		0.045	0.045	R	30.5	30.5
34		0.045	0.045	R	30.5	30.5
35		0.045	0.045	R	30.5	30.5
36		0.025	0.025	R	11.5	11.5
37		0.082	0.082	R	46	46
38		0.045	0.045	R	30.5	30.5
39		0.040	0.040	R	21.5	21.5
40		0.035	0.035	R	16.5	16.5
41		0.025	0.025	R	11.5	11.5
42		0.005	0.005	R	3	3
43		0.020	0.020	R	8	8
44		0.010	0.010	R	4.5	4.5
45		0.020	0.020	R	8	8
46		0.020	0.020	R	8	8
47		0.050	0.050	R	40	40
48		0.030	0.030	R	14	14
49		0.030	0.030	R	14	14
50		0.020	0.020	R	8	8
51		0.040	0.040	R	21.5	21.5
52	APWC0701S001	0.040	0.040	S	21.5	0
53	APWC0702S001	0.038	0.038	S	18	0
54	APWC0703S001	-0.016	-0.016	S	1	0
55	APWC0704S001	0.002	0.002	S	2	0
Sum					1540.0	1497.5

Appendix 2
Radionuclide Results

ISRA Outfall 009 - AP/STP-1F

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
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Americium-241	0.0233	0.079	0.15	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Americium-241	-0.0025	0.128	0.21	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Americium-241	0.0706	0.134	0.253	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Americium-241	-0.113	0.138	0.253	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Cesium-134	0	0.041	0.0505	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Cesium-134	0.0379	0.0346	0.0641	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Cesium-134	0	0.0428	0.0637	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Cesium-134	0.0536	0.0424	0.0588	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Cesium-137	0.0142	0.0218	0.0389	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Cesium-137	0.00096	0.0284	0.0502	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Cesium-137	-0.0215	0.0258	0.0426	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Cesium-137	0.0574	0.0375	0.0403	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Cobalt-60	-0.00042	0.0221	0.0377	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Cobalt-60	0.00536	0.0282	0.0495	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Cobalt-60	-0.00387	0.0244	0.0407	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Cobalt-60	0.00131	0.0242	0.0418	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Europium-152	-0.0354	0.0725	0.0956	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Europium-152	-0.0359	0.0792	0.126	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Europium-152	0.0271	0.0758	0.119	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Europium-152	0.069	0.0698	0.109	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Europium-154	-0.00484	0.0719	0.123	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Europium-154	0.0901	0.0947	0.175	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Europium-154	-0.0218	0.09	0.142	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Europium-154	0.00229	0.089	0.154	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Manganese-54	-0.0118	0.0215	0.0352	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Manganese-54	-0.002	0.0278	0.0478	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Manganese-54	0.0241	0.0269	0.0484	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Manganese-54	-0.00798	0.023	0.0388	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Potassium-40	24.2	2.35	0.308	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Potassium-40	21.9	2.27	0.375	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Potassium-40	23.3	2.42	0.453	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Potassium-40	24.1	2.52	0.317	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Sodium-22	-0.00214	0.0253	0.0433	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Sodium-22	0.0313	0.0334	0.0619	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Sodium-22	-0.00692	0.0317	0.0501	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Sodium-22	0.00417	0.0312	0.0545	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Strontium-90	0.04	0.0284	0.0449	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Strontium-90	0.0384	0.0292	0.0471	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Strontium-90	-0.0156	0.0226	0.0464	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Strontium-90	0.00242	0.0252	0.0461	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Thorium-228	1.34	0.186	0.0596	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Thorium-228	1.45	0.167	0.0703	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Thorium-228	1.38	0.164	0.0733	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Thorium-228	1.14	0.146	0.0793	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Thorium-232	1.36	0.245	0.131	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Thorium-232	1.41	0.282	0.181	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Thorium-232	1.45	0.278	0.187	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Thorium-232	1.25	0.239	0.146	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Tritium	-0.0896	0.585	1.01	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Tritium	-0.212	0.579	1.01	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Tritium	0.226	0.599	1.02	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Tritium	0.0444	0.584	1.01	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Uranium-235	-0.0358	0.127	0.227	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Uranium-235	0.0873	0.15	0.271	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Uranium-235	0.105	0.146	0.271	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Uranium-235	-0.0405	0.133	0.232	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0701	APWC0701S001	Soil	Uranium-238	0.203	0.744	1.4	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0702	APWC0702S001	Soil	Uranium-238	1.62	1.21	1.66	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0703	APWC0703S001	Soil	Uranium-238	0.632	1.18	2.16	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste
2010 ISRA Waste Characterization	MWH	7/30/2010	AP/STP-1F	APWC0704	APWC0704S001	Soil	Uranium-238	1.17	1.18	2.2	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	257647	Waste

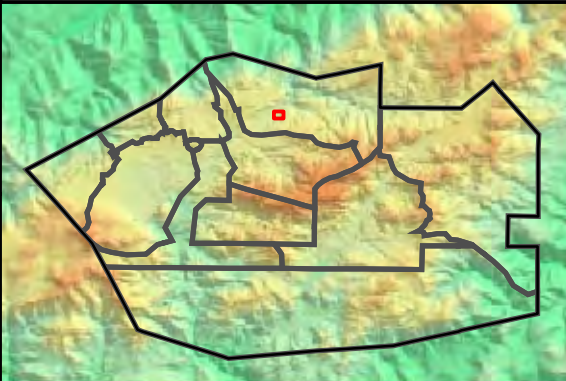
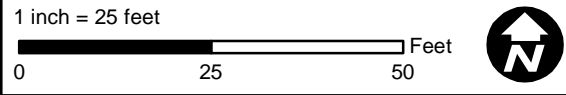
Outfall 009
Sample Locations for AP/STP - 1F

- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - Dirt Road
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Figure Legend**
- Waste Characterization Sample



Document: ISRA_Plots_SP_RD47_SampleLocations_060710.mxd Date: Jun 22, 2010



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

FIGURE X

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA OUTFALL 009 PLANNED EXCAVATION B1-1A

Introduction

This report presents supporting detailed information for the April 28, 2010 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area I, near the former B-1 engine testing facility.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area I 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 I 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 guidelines presented in U.S. EPA SW-846 are followed in evaluating the adequacy of sampling and the application of analytical results to regulatory thresholds. 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. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation B1-1A was based partly on the Group 1A RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals, Petroleum Hydrocarbons (TPH), and Semi-Volatile Organic Compounds (SVOC) should be addressed in the B1-1A excavation footprint. Based on random sampling, five (5) sample collection points were identified within the planned excavation footprint. This initial sample size was considered adequate for the relatively small area designated for excavation at B1-1A. The samples were analyzed for CAM 17 metals, TPH, and SVOCs. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the B1-1A planned excavation area are presented in GEL Laboratories reports 251958 issued on 5/10/10 and 254951 issued 6/29/10. Only very low concentrations of Regulated Metals were detected in any of the samples from B1-1A. All of the detected Regulated Metals were well below 10-Times their respective California Soluble Threshold Limits (STLC) and no further testing was required.

Trace concentrations of TPH were detected. In no case were the detected concentrations greater than 28 parts per million (ppm). Gasoline range Petroleum Hydrocarbons were not detected.

Very low concentrations of some SVOCs were detected in the soil samples from B1-1A, none of which were above the parts per billion level. Specific hazardous waste thresholds have been established in the regulations for only a small number of SVOCs. There were no exceedances of established limits. Furthermore, none of the detected SVOCs exceeded U.S. EPA Region IX "Preliminary Remediation Goals (PRG)" values for residential soils.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area I B1-1A:

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 if it is applied to 22 CCR 66261.24(a)(7)

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 B1-1A is NON-HAZARDOUS.

Outfall 009 Waste Characterization Sample Locations for B1-1A

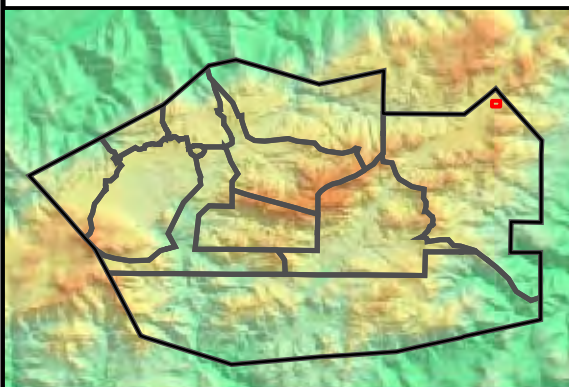
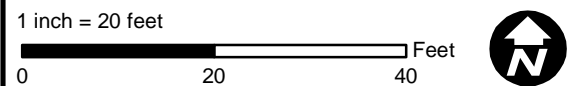
- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Base Map Legend**
- ISRA Excavation Boundary
 - Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_B1-1A_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



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

FIGURE 1

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				<table border="1"> <tr> <td>Object Name:</td> <td>B1WC0016</td> <td>B1WC0017</td> <td>B1WC0018</td> <td>B1WC0027</td> <td>B1WC0028</td> </tr> <tr> <td>Sample Name:</td> <td>B1WC0016S001</td> <td>B1WC0017S001</td> <td>B1WC0018S001</td> <td>B1WC0027S001</td> <td>B1WC0028S001</td> </tr> <tr> <td>Collection Date:</td> <td>4/28/2010</td> <td>4/28/2010</td> <td>4/28/2010</td> <td>6/17/2010</td> <td>6/17/2010</td> </tr> <tr> <td>Sample Depth (feet):</td> <td>0.0 - 0.5</td> <td>1.5 - 2.0</td> <td>0.0 - 0.5</td> <td>1.0 - 1.5</td> <td>0.5 - 1.0</td> </tr> </table>						Object Name:	B1WC0016	B1WC0017	B1WC0018	B1WC0027	B1WC0028	Sample Name:	B1WC0016S001	B1WC0017S001	B1WC0018S001	B1WC0027S001	B1WC0028S001	Collection Date:	4/28/2010	4/28/2010	4/28/2010	6/17/2010	6/17/2010	Sample Depth (feet):	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.0 - 1.5	0.5 - 1.0
Object Name:	B1WC0016	B1WC0017	B1WC0018	B1WC0027	B1WC0028																												
Sample Name:	B1WC0016S001	B1WC0017S001	B1WC0018S001	B1WC0027S001	B1WC0028S001																												
Collection Date:	4/28/2010	4/28/2010	4/28/2010	6/17/2010	6/17/2010																												
Sample Depth (feet):	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.0 - 1.5	0.5 - 1.0																												
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c																								
METALS																																	
Antimony	mg/kg	500	150	--	0.795	0.194 J	0.228	<1.59	<1.58																								
Arsenic	mg/kg	500	50	100	7.35	6.43	5.32	9.15	9.19																								
Barium	mg/kg	10,000	1,000	2,000	77.7	83.9	74.9	73.4	70.2																								
Beryllium	mg/kg	75	7.5	--	0.449	0.663	0.422	<0.0965	<0.0958																								
Cadmium	mg/kg	100	10	20	1.17	0.0409 J	0.32	<0.0965	<0.0958																								
Chromium	mg/kg	500	50	100	24.6	19.1	20.5	15.7	13.5																								
Cobalt	mg/kg	8,000	800	--	7.48	6.06	6.19	4.94	3.71																								
Copper	mg/kg	2,500	250	--	43.4	10.2	12.5	11.7	8.36																								
Lead	mg/kg	1,000	50	100	15.1	5.55	5.83	3.74	2.8																								
Mercury	mg/kg	20	2	4	0.0309 J	0.013 J	0.0107 J	0.00797 J	0.00813 J																								
Molybdenum	mg/kg	3,500	3,500	--	2.79	0.751	0.402	0.947 J	0.802 J																								
Nickel	mg/kg	2,000	200	--	28.5	12.8	16.4	9.34	9.19																								
Selenium	mg/kg	100	10	20	0.144 J	0.0827 J	0.122 J	6.92	5.59																								
Silver	mg/kg	500	50	100	0.0771 J	0.0464 J	0.0235 J	0.505 J	<0.0958																								
Thallium	mg/kg	700	70	--	0.226	0.23	0.2	<0.483	<0.479																								
Vanadium	mg/kg	2,400	240	--	32.5	36.1	33.7	32	28.3																								
Zinc	mg/kg	5,000	2,500	--	73.2	48.3	58.7	45.3	37.9																								
TPH																																	
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	<9.1 {<9.1}	<10 {<10}	<1 {<1}	<1 {<1}	<1 {<1}																								
EFH (C10 - C24)	mg/kg	--	--	--	<12 {<4}	<12 {<4}	<12 {<4}	<12 {<4}	<12 {<4}																								
EFH (C10 - C40)	mg/kg	--	--	--	28	6.4 J	8.3 J	7.3 J	13																								
EFH (C25 - C40)	mg/kg	--	--	--	25	<12 {<4}	6.1 J	6.1 J	12 J																								
SVOCs																																	
1,1'-Biphenyl	ug/kg	--	--	--	<167 {<50}	<166 {<49.9}	<167 {<50}	<332 {<99.5}	<332 {<99.5}																								
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}																								
1,2-Dichlorobenzene	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}																								
1,3-Dichlorobenzene	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}																								
1,4-Dichlorobenzene	ug/kg	--	--	150,000	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}																								
1-Naphthylamine	ug/kg	--	--	--	<167 {<50}	<166 {<49.9}	<167 {<50}	<332 {<99.5}	<332 {<99.5}																								
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}																								
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}																								
2,4-Dichlorophenol	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}																								
2,4-Dimethylphenol	ug/kg	--	--	--	<167 {<58.3}	<166 {<58.2}	<167 {<58.3}	<332 {<116}	<332 {<116}																								
2,4-Dinitrophenol	ug/kg	--	--	--	<333 {<63.3}	<333 {<63.2}	<333 {<63.3}	<663 {<126}	<663 {<126}																								
2,4-Dinitrotoluene	ug/kg	--	--	2,600	<167 {<16.7}	<166 {<16.6}	<167 {<16.7}	<332 {<33.2}	<332 {<33.2}																								

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	B1WC0016	B1WC0017	B1WC0018	B1WC0027	B1WC0028
				Sample Name:	B1WC0016S001	B1WC0017S001	B1WC0018S001	B1WC0027S001	B1WC0028S001
				Collection Date:	4/28/2010	4/28/2010	4/28/2010	6/17/2010	6/17/2010
				Sample Depth (feet):	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.0 - 1.5	0.5 - 1.0
ANALYTE	UNITS	TTLC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
2,6-Dinitrotoluene	ug/kg	--	--	--	<167 {<16.7}	<166 {<16.6}	<167 {<16.7}	<332 {<33.2}	<332 {<33.2}
2-Chloronaphthalene	ug/kg	--	--	--	<16.7 {<5.5}	<16.6 {<5.49}	<16.7 {<5.5}	<33.2 {<10.9}	<33.2 {<10.9}
2-Chlorophenol	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
2-Methylnaphthalene	ug/kg	--	--	--	<16.7 {<3.33}	<16.6 {<3.33}	<16.7 {<3.33}	<33.2 {<6.63}	<33.2 {<6.63}
2-Methylphenol	ug/kg	--	--	200	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
2-Naphthylamine	ug/kg	--	--	--	<167 {<55}	<166 {<54.9}	<167 {<55}	<332 {<109}	<332 {<109}
2-Nitroaniline	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
2-Nitrophenol	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
3,3-Dichlorobenzidine	ug/kg	--	--	--	<167 {<50}	<166 {<49.9}	<167 {<50}	<332 {<99.5}	<332 {<99.5}
3-Nitroaniline	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
4-Aminobiphenyl	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
4-Bromophenyl phenyl ether	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
4-Chloro-3-methylphenol	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
4-Chloroaniline	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
4-Chlorophenyl-phenylether	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
4-Methylphenol	ug/kg	--	--	200	<167 {<50}	<166 {<49.9}	<167 {<50}	<332 {<99.5}	<332 {<99.5}
4-Nitroaniline	ug/kg	--	--	--	<167 {<50}	<166 {<49.9}	<167 {<50}	<332 {<99.5}	<332 {<99.5}
4-Nitrophenol	ug/kg	--	--	--	<167 {<55}	<166 {<54.9}	<167 {<55}	<332 {<109}	<332 {<109}
Acenaphthene	ug/kg	--	--	--	<16.7 {<5.5}	<16.6 {<5.49}	<16.7 {<5.5}	<33.2 {<10.9}	<33.2 {<10.9}
Acenaphthylene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}
Acetophenone	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
Anthracene	ug/kg	--	--	--	<16.7 {<3.33}	<16.6 {<3.33}	<16.7 {<3.33}	<33.2 {<6.63}	<33.2 {<6.63}
Atrazine	ug/kg	--	--	--	<167 {<50}	<166 {<49.9}	<167 {<50}	<332 {<99.5}	<332 {<99.5}
Benzaldehyde	ug/kg	--	--	--	<167 {<50}	<166 {<49.9}	<167 {<50}	<332 {<99.5}	<332 {<99.5}
Benzenidine	ug/kg	--	--	--	<167 {<50}	<166 {<49.9}	<167 {<50}	<332 {<99.5}	<332 {<99.5}
Benzo(a)anthracene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}
Benzo(a)pyrene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}
Benzo(b)fluoranthene	ug/kg	--	--	--	6.87 J	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}
Benzo(ghi)perylene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}
Benzo(k)fluoranthene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
Bis(2-chloroethyl)ether	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	85.9 J	34 J	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}
Butyl benzyl phthalate	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

					Object Name:	B1WC0016	B1WC0017	B1WC0018	B1WC0027	B1WC0028
					Sample Name:	B1WC0016S001	B1WC0017S001	B1WC0018S001	B1WC0027S001	B1WC0028S001
					Collection Date:	4/28/2010	4/28/2010	4/28/2010	6/17/2010	6/17/2010
					Sample Depth (feet):	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	1.0 - 1.5	0.5 - 1.0
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Caprolactam	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Carbazole	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Chrysene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Dibenzo(a,h)anthracene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Dibenzofuran	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Diethyl phthalate	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Dimethyl phthalate	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Di-n-butyl phthalate	ug/kg	--	--	--	38.7 J	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Di-n-octyl phthalate	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Diphenylamine	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Fluoranthene	ug/kg	--	--	--	6.27 J	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Fluorene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Hexachlorobenzene	ug/kg	--	--	2,600	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Hexachlorobutadiene	ug/kg	--	--	10,000	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Hexachlorocyclopentadiene	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Hexachloroethane	ug/kg	--	--	60,000	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Isophorone	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Naphthalene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Nitrobenzene	ug/kg	--	--	40,000	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
n-Nitrosodimethylamine	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	<167 {<41.7}	<166 {<41.6}	<167 {<41.7}	<332 {<82.9}	<332 {<82.9}	
Phenanthrene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Phenol	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
Pyrene	ug/kg	--	--	--	<16.7 {<5}	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Pyridine	ug/kg	--	--	--	<167 {<33.3}	<166 {<33.3}	<167 {<33.3}	<332 {<66.3}	<332 {<66.3}	
RADIONUCLIDES	--	--	--	--	R	R	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1 AND B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

H - Analytical holding time was exceeded.

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

SU - Standard Units

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA OUTFALL 009 PLANNED EXCAVATION B1-1B

Introduction

This report presents supporting detailed information for the April 28, 2010 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area I, near the former B-1 engine testing facility.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area I 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 I 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 guidelines presented in U.S. EPA SW-846 are followed in evaluating the adequacy of sampling and the application of analytical results to regulatory thresholds. 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. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation B1-1B was based partly on the Group 1A RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals, Petroleum Hydrocarbons (TPH), and Semi-Volatile Organic Compounds (SVOC) should be addressed in the B1-1B excavation footprint. Based on random sampling, four (4) sample collection points were identified within the planned excavation footprint. This initial sample size was considered adequate for the relatively small area designated for excavation at B1-1B. The samples were analyzed for CAM 17 metals, TPH, and SVOCs. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the B1-1B planned excavation area are presented in GEL Laboratories reports 251958 issued on 5/10/10, 254951 issued 6/29/10, and 255483 issued 7/7/10. Regulated Metals were far below 10-Times their respective California Soluble Threshold Limits (STLC) in all cases, with the exception of one sample that exhibited Selenium at 15.2 parts per million (ppm). This is above the 10 ppm 10X STLC threshold. The Selenium concentrations in

the other 3 samples ranged between 0.257 ppm and 8.73 ppm. Subsequent analysis of the elevated sample, by the California Waste Extraction Test (WET) for leaching properties as required, resulted in a concentration of 0.101 milligrams per liter (mg/L), well below the 1 mg/L STLC hazardous waste limit.

Low concentrations of TPH were detected. The highest TPH level was exhibited by one sample with a concentration of 100 ppm. The TPH concentration in the other three samples ranged between Non-Detect and 21 ppm. These concentrations are below permit limits set for Municipal Solid Waste landfills. Gasoline range Petroleum Hydrocarbons were not detected.

Only one SVOC was detected in the soil samples from B1-1B. Pentachlorophenol was detected at 0.0755 ppm in one sample. This is one of a limited number of SVOCs for which direct hazardous waste regulatory thresholds have been established. The 10X STLC threshold is 17 ppm, while the RCRA 20X Toxicity Characteristic Leaching Procedure threshold is 2,000 ppm.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area I B1-1B:

- 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 if it is applied to 22 CCR 66261.24(a)(7)
 - 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 B1-1B is NON-HAZARDOUS.

Outfall 009 Waste Characterization Sample Locations for B1-1B

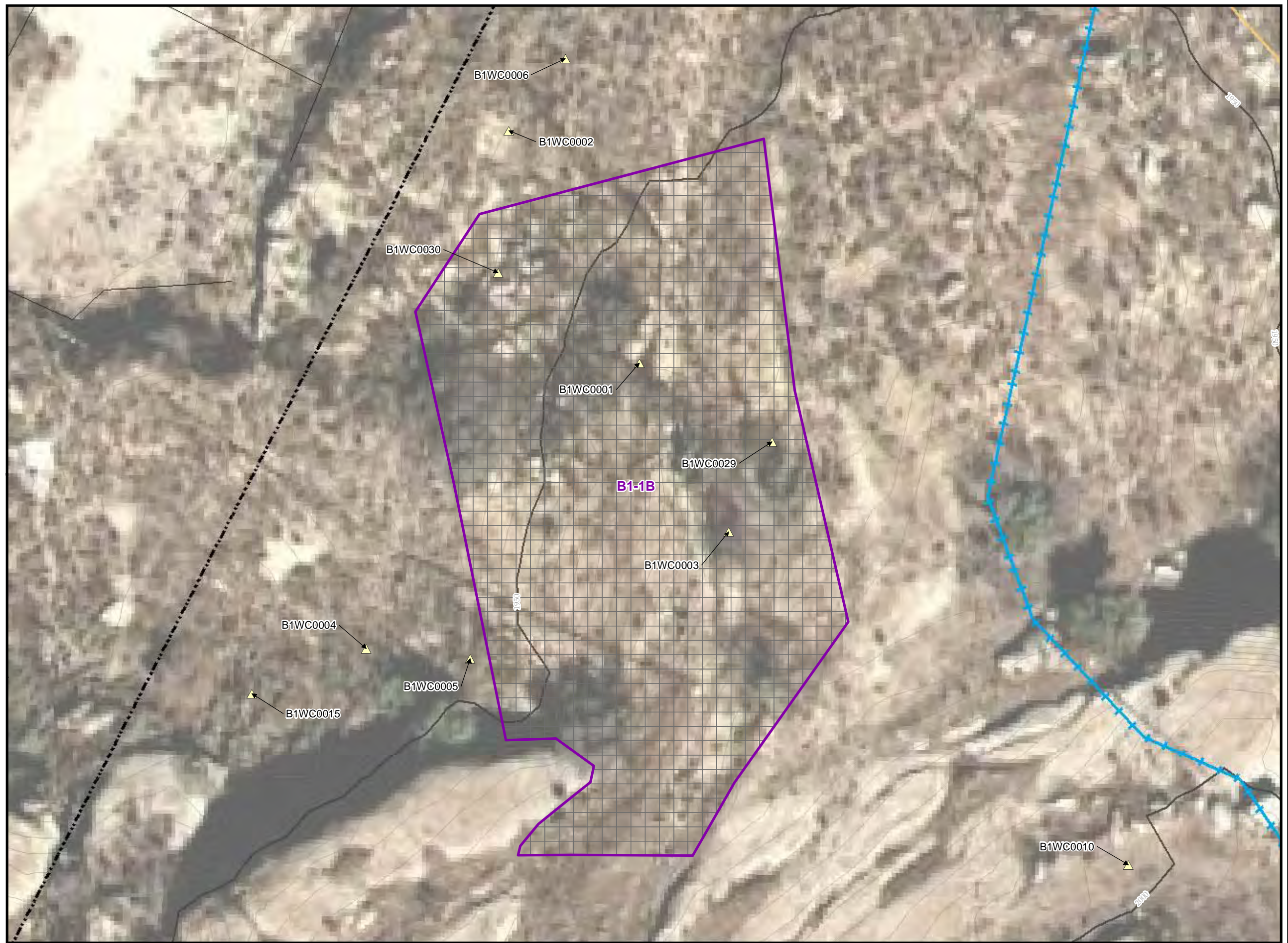
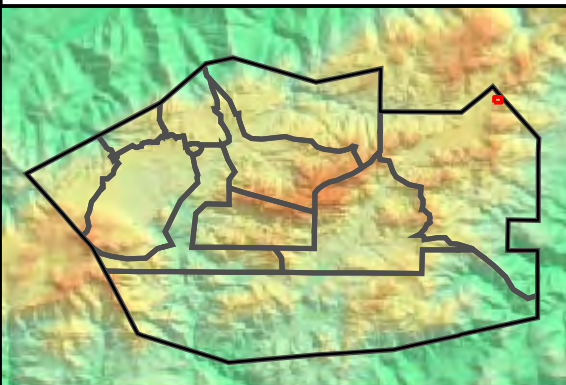
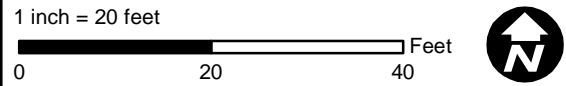
- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Base Map Legend**
- ISRA Excavation Boundary
 - Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_B1-1B_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1B
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0001	B1WC0003	B1WC0029	B1WC0030
						Sample Name:	B1WC0001S001	B1WC0003S001	B1WC0029S001	B1WC0030S001
						Collection Date:	4/28/2010	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	1.0 - 1.5	0.5 - 1.0	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
METALS										
Antimony	mg/kg	500	150	--	--	0.185 J	0.221	<0.325	<0.321	
Arsenic	mg/kg	500	50	100	--	9.29	6.36	16.5	8.88	
Barium	mg/kg	10,000	1,000	2,000	--	58.9	48.6	86.9	71.5	
Beryllium	mg/kg	75	7.5	--	--	0.635	0.51	0.339 J	<0.0973	
Cadmium	mg/kg	100	10	20	--	0.0628 J	0.0711 J	<0.492	<0.0973	
Chromium	mg/kg	500	50	100	--	20.9	17.4	24.2	15.9	
Cobalt	mg/kg	8,000	800	--	--	6.16	4.33	8.28	5.19	
Copper	mg/kg	2,500	250	--	--	12.6	12.5	18.5	9	
Lead	mg/kg	1,000	50	100	--	6.52	9.44	17.1	16.6	
Mercury	mg/kg	20	2	4	--	<0.0113	<0.0112	0.0223	0.0157	
Molybdenum	mg/kg	3,500	3,500	--	--	0.447	0.49	1.63	1.05	
Nickel	mg/kg	2,000	200	--	--	10.9	8.86	11.4	9.62	
Selenium	mg/kg	100	10	20	--	0.257 J	0.343 J	15.2	8.73	
Selenium, WET	mg/L	--	--	--	1	--	--	0.101 J	--	
Silver	mg/kg	500	50	100	--	0.0371 J	0.0241 J	<0.492	<0.486	
Thallium	mg/kg	700	70	--	--	0.311	0.236	<0.492	<0.486	
Vanadium	mg/kg	2,400	240	--	--	35.9	31.1	52.1	31.7	
Zinc	mg/kg	5,000	2,500	--	--	60.9	54.8	75.6	83.6	
TPH										
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	--	<9.4 {<9.4}	<9.1 {<9.1}	<1 {<1}	<9.6 {<9.6}	
EFH (C10 - C24)	mg/kg	--	--	--	--	<16 {<5.4}	<12 {<4}	<12 {<4}	12 J	
EFH (C10 - C40)	mg/kg	--	--	--	--	<16 {<5.4}	21	<12 {<4}	100	
EFH (C25 - C40)	mg/kg	--	--	--	--	<16 {<5.4}	19	<12 {<4}	92	
SVOCs										
1,1'-Biphenyl	ug/kg	--	--	--	--	<166 {<49.9}	<167 {<50}	<332 {<99.7}	<333 {<99.8}	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
1-Naphthylamine	ug/kg	--	--	--	--	<166 {<49.9}	<167 {<50}	<332 {<99.7}	<333 {<99.8}	
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
2,4-Dichlorophenol	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
2,4-Dimethylphenol	ug/kg	--	--	--	--	<166 {<58.2}	<167 {<58.3}	<332 {<116}	<333 {<116}	
2,4-Dinitrophenol	ug/kg	--	--	--	--	<332 {<63.2}	<333 {<63.3}	<665 {<126}	<665 {<126}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1B
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

ANALYTE	UNITS	TTLC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	Object Name:	B1WC0001	B1WC0003	B1WC0029	B1WC0030
						Sample Name:	B1WC0001S001	B1WC0003S001	B1WC0029S001	B1WC0030S001
						Collection Date:	4/28/2010	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	1.0 - 1.5	0.5 - 1.0	0.5 - 1.0	0.0 - 0.5
						RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<166 {<16.6}	<167 {<16.7}	<332 {<33.2}	<333 {<33.3}	
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<166 {<16.6}	<167 {<16.7}	<332 {<33.2}	<333 {<33.3}	
2-Chloronaphthalene	ug/kg	--	--	--	--	<16.6 {<5.49}	<16.7 {<5.5}	<33.2 {<11}	<33.3 {<11}	
2-Chlorophenol	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
2-Methylnaphthalene	ug/kg	--	--	--	--	<16.6 {<3.32}	<16.7 {<3.33}	<33.2 {<6.65}	<33.3 {<6.65}	
2-Methylphenol	ug/kg	--	--	200	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
2-Naphthylamine	ug/kg	--	--	--	--	<166 {<54.9}	<167 {<55}	<332 {<110}	<333 {<110}	
2-Nitroaniline	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
2-Nitrophenol	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
3,3-Dichlorobenzidine	ug/kg	--	--	--	--	<166 {<49.9}	<167 {<50}	<332 {<99.7}	<333 {<99.8}	
3-Nitroaniline	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
4-Aminobiphenyl	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
4-Chloroaniline	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
4-Chlorophenyl-phenylether	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
4-Methylphenol	ug/kg	--	--	200	--	<166 {<49.9}	<167 {<50}	<332 {<99.7}	<333 {<99.8}	
4-Nitroaniline	ug/kg	--	--	--	--	<166 {<49.9}	<167 {<50}	<332 {<99.7}	<333 {<99.8}	
4-Nitrophenol	ug/kg	--	--	--	--	<166 {<54.9}	<167 {<55}	<332 {<110}	<333 {<110}	
Acenaphthene	ug/kg	--	--	--	--	<16.6 {<5.49}	<16.7 {<5.5}	<33.2 {<11}	<33.3 {<11}	
Acenaphthylene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Acetophenone	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Anthracene	ug/kg	--	--	--	--	<16.6 {<3.32}	<16.7 {<3.33}	<33.2 {<6.65}	<33.3 {<6.65}	
Atrazine	ug/kg	--	--	--	--	<166 {<49.9}	<167 {<50}	<332 {<99.7}	<333 {<99.8}	
Benzaldehyde	ug/kg	--	--	--	--	<166 {<49.9}	<167 {<50}	<332 {<99.7}	<333 {<99.8}	
Benzidine	ug/kg	--	--	--	--	<166 {<49.9}	<167 {<50}	<332 {<99.7}	<333 {<99.8}	
Benzo(a)anthracene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Benzo(a)pyrene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Benzo(b)fluoranthene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Benzo(ghi)perylene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1B
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0001	B1WC0003	B1WC0029	B1WC0030
						Sample Name:	B1WC0001S001	B1WC0003S001	B1WC0029S001	B1WC0030S001
						Collection Date:	4/28/2010	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	1.0 - 1.5	0.5 - 1.0	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Butyl benzyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Caprolactam	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Carbazole	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Chrysene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Dibenzofuran	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Diethyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Dimethyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Di-n-butyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Di-n-octyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Diphenylamine	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Fluoranthene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Fluorene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Hexachlorobenzene	ug/kg	--	--	2,600	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Hexachloroethane	ug/kg	--	--	60,000	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Isophorone	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Naphthalene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Nitrobenzene	ug/kg	--	--	40,000	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
n-Nitrosodimethylamine	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<166 {<41.6}	75.5 J {<41.7}	<332 {<83.1}	<333 {<83.1}	
Phenanthrene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Phenol	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
Pyrene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.7 {<5}	<33.2 {<9.97}	<33.3 {<9.98}	
Pyridine	ug/kg	--	--	--	--	<166 {<33.2}	<167 {<33.3}	<332 {<66.5}	<333 {<66.5}	
RADIONUCLIDES	--	--	--	--	--	R	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1 AND B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

H - Analytical holding time was exceeded.

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

SU - Standard Units

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA OUTFALL 009 PLANNED EXCAVATION B1-1C

Introduction

This report presents supporting detailed information for the June 17, 2010 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area I, near the former B-1 engine testing facility.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area I 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 I 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 guidelines presented in U.S. EPA SW-846 are followed in evaluating the adequacy of sampling and the application of analytical results to regulatory thresholds. 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. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation B1-1C was based partly on the Group 1A RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals, Petroleum Hydrocarbons (TPH), and Semi-Volatile Organic Compounds (SVOC) should be addressed in the B1-1C excavation footprint. Based on random sampling, two (2) sample collection points were identified within the planned excavation footprint. This initial sample size was considered adequate for the very small area designated for excavation at B1-1C. The samples were analyzed for CAM 17 metals, TPH, and SVOCs. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the B1-1C planned excavation area are presented in GEL Laboratories report 254951 issued 6/29/10. All Regulated Metals were far below 10-Times their respective California Soluble Threshold Limits (STLC). Consequently, no further testing was required.

Very low concentrations of TPH were detected. The highest TPH concentration was observed at 33 ppm. Gasoline range Petroleum Hydrocarbons were not detected. No SVOCs were detected.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area I B1-1C:

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 if it is applied to 22 CCR 66261.24(a)(7)

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 B1-1C is NON-HAZARDOUS.

Outfall 009 Waste Characterization Sample Locations for B1-1C and B1-1D

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- NPDES Outfall
- A/C Paving
- Drainage
- Non Jurisdictional Surface Water Pathway
- Surface Water Divide
- Elevation Contour

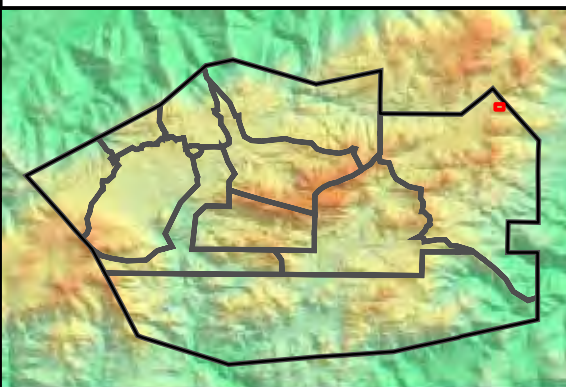
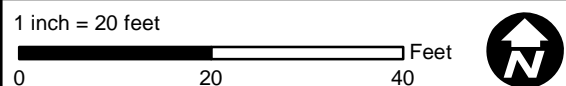
Base Map Legend

- ISRA Excavation Boundary
- Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_B1-1C&1D_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



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

FIGURE 1

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1C
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:		B1WC0031	B1WC0032
				Sample Name:		B1WC0031S001	B1WC0032S001
				Collection Date:		6/17/2010	6/17/2010
				Sample Depth (feet):		0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	RESULT^c	RESULT^c	
METALS							
Antimony	mg/kg	500	150	--	<1.6	<1.65	
Arsenic	mg/kg	500	50	100	9.47	8.9	
Barium	mg/kg	10,000	1,000	2,000	90.3	79.7	
Beryllium	mg/kg	75	7.5	--	<0.0971	<0.1	
Cadmium	mg/kg	100	10	20	<0.0971	<0.1	
Chromium	mg/kg	500	50	100	15.1	14.5	
Cobalt	mg/kg	8,000	800	--	4.79	4.54	
Copper	mg/kg	2,500	250	--	10.3	10.4	
Lead	mg/kg	1,000	50	100	7.29	13.5	
Mercury	mg/kg	20	2	4	0.027	0.0202	
Molybdenum	mg/kg	3,500	3,500	--	0.881 J	0.92 J	
Nickel	mg/kg	2,000	200	--	10.5	10.3	
Selenium	mg/kg	100	10	20	6.97	7.66	
Silver	mg/kg	500	50	100	<0.0971	<0.1	
Thallium	mg/kg	700	70	--	<0.485	<0.5	
Vanadium	mg/kg	2,400	240	--	29.3	28.8	
Zinc	mg/kg	5,000	2,500	--	49.4	53.2	
TPH							
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	<96 {<96}	<9.7 {<9.7}	
EFH (C10 - C24)	mg/kg	--	--	--	<12 {<4}	<12 {<4}	
EFH (C10 - C40)	mg/kg	--	--	--	12 J	33	
EFH (C25 - C40)	mg/kg	--	--	--	10 J	30	
SVOCs							
1,1'-Biphenyl	ug/kg	--	--	--	<333 {<99.8}	<332 {<99.7}	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
1,2-Dichlorobenzene	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
1,3-Dichlorobenzene	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
1,4-Dichlorobenzene	ug/kg	--	--	150,000	<333 {<66.6}	<332 {<66.5}	
1-Naphthylamine	ug/kg	--	--	--	<333 {<99.8}	<332 {<99.7}	
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	<333 {<66.6}	<332 {<66.5}	
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	<333 {<66.6}	<332 {<66.5}	
2,4-Dichlorophenol	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
2,4-Dimethylphenol	ug/kg	--	--	--	<333 {<116}	<332 {<116}	
2,4-Dinitrophenol	ug/kg	--	--	--	<666 {<126}	<665 {<126}	
2,4-Dinitrotoluene	ug/kg	--	--	2,600	<333 {<33.3}	<332 {<33.2}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1C
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

					Object Name:	B1WC0031	B1WC0032
					Sample Name:	B1WC0031S001	B1WC0032S001
					Collection Date:	6/17/2010	6/17/2010
					Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	RESULT^c	RESULT^c	
2,6-Dinitrotoluene	ug/kg	--	--	--	<333 {<33.3}	<332 {<33.2}	
2-Chloronaphthalene	ug/kg	--	--	--	<33.3 {<11}	<33.2 {<11}	
2-Chlorophenol	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
2-Methylnaphthalene	ug/kg	--	--	--	<33.3 {<6.66}	<33.2 {<6.65}	
2-Methylphenol	ug/kg	--	--	200	<333 {<66.6}	<332 {<66.5}	
2-Naphthylamine	ug/kg	--	--	--	<333 {<110}	<332 {<110}	
2-Nitroaniline	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
2-Nitrophenol	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
3,3-Dichlorobenzidine	ug/kg	--	--	--	<333 {<99.8}	<332 {<99.7}	
3-Nitroaniline	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
4-Aminobiphenyl	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
4-Bromophenyl phenyl ether	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
4-Chloro-3-methylphenol	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
4-Chloroaniline	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
4-Chlorophenyl-phenylether	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
4-Methylphenol	ug/kg	--	--	200	<333 {<99.8}	<332 {<99.7}	
4-Nitroaniline	ug/kg	--	--	--	<333 {<99.8}	<332 {<99.7}	
4-Nitrophenol	ug/kg	--	--	--	<333 {<110}	<332 {<110}	
Acenaphthene	ug/kg	--	--	--	<33.3 {<11}	<33.2 {<11}	
Acenaphthylene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Acetophenone	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Anthracene	ug/kg	--	--	--	<33.3 {<6.66}	<33.2 {<6.65}	
Atrazine	ug/kg	--	--	--	<333 {<99.8}	<332 {<99.7}	
Benzaldehyde	ug/kg	--	--	--	<333 {<99.8}	<332 {<99.7}	
Benzdine	ug/kg	--	--	--	<333 {<99.8}	<332 {<99.7}	
Benzo(a)anthracene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Benzo(a)pyrene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Benzo(b)fluoranthene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Benzo(ghi)perylene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Benzo(k)fluoranthene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Bis(2-chloroethyl)ether	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Butyl benzyl phthalate	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1C
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

					Object Name:	B1WC0031	B1WC0032
					Sample Name:	B1WC0031S001	B1WC0032S001
					Collection Date:	6/17/2010	6/17/2010
					Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	RESULT^c	RESULT^c	
Caprolactam	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Carbazole	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Chrysene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Dibenzo(a,h)anthracene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Dibenzofuran	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Diethyl phthalate	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Dimethyl phthalate	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Di-n-butyl phthalate	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Di-n-octyl phthalate	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Diphenylamine	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Fluoranthene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Fluorene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Hexachlorobenzene	ug/kg	--	--	2,600	<333 {<66.6}	<332 {<66.5}	
Hexachlorobutadiene	ug/kg	--	--	10,000	<333 {<66.6}	<332 {<66.5}	
Hexachlorocyclopentadiene	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Hexachloroethane	ug/kg	--	--	60,000	<333 {<66.6}	<332 {<66.5}	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Isophorone	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Naphthalene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Nitrobenzene	ug/kg	--	--	40,000	<333 {<66.6}	<332 {<66.5}	
n-Nitrosodimethylamine	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	<333 {<83.2}	<332 {<83.1}	
Phenanthrene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Phenol	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
Pyrene	ug/kg	--	--	--	<33.3 {<9.98}	<33.2 {<9.97}	
Pyridine	ug/kg	--	--	--	<333 {<66.6}	<332 {<66.5}	
RADIONUCLIDES	--	--	--	--	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1 AND B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

H - Analytical holding time was exceeded.

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

SU - Standard Units

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA OUTFALL 009 PLANNED EXCAVATION B1-1D

Introduction

This report presents supporting detailed information for the April 27, 2010 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area I, near the former B-1 engine testing facility.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area I 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 I 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 guidelines presented in U.S. EPA SW-846 are followed in evaluating the adequacy of sampling and the application of analytical results to regulatory thresholds. 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. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation B1-1D was based partly on the Group 1A RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals, Petroleum Hydrocarbons (TPH), and Semi-Volatile Organic Compounds (SVOC) should be addressed in the B1-1D excavation footprint. Based on random sampling, ten (10) sample collection points were identified within the planned excavation footprint. This initial sample size was considered to be necessary considering the possibility of topographical influences on the homogeneity of accumulated soil at B1-1D. The samples were analyzed for CAM 17 metals, TPH, and SVOCs. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the B1-1D planned excavation area are presented in GEL Laboratories reports 251901 issued on 5/7/10, 251958 issued 5/10/10, 252523 issued 5/14/10, and 254951 issued 6/29/10. Regulated Metals were far below 10-Times their respective California Soluble Threshold Limits (STLC) in all cases, with the exception of one sample that exhibited Mercury at 3.82 parts per million (ppm). This is above the 2 ppm 10X STLC threshold. The Mercury

concentrations in the other 9 samples ranged between Non-Detect and 0.0151 ppm. Subsequent analysis of the elevated sample, by the California Waste Extraction Test (WET) for leaching properties as required, resulted in a concentration of 0.0145 milligrams per liter (mg/L), well below the 0.2 mg/L STLC hazardous waste limit.

Low concentrations of TPH were detected. These ranged between 5 ppm and 41 ppm, concentrations which do not bear on hazardous waste determinations. Gasoline range Petroleum Hydrocarbons were not detected.

Among SVOCs, Bis(2-Ethylhexyl)phthalate was detected in two of the soil samples from B1-1D, with concentrations of 0.0724 ppm and 0.207 ppm. Pyrene was also detected in one sample, at a concentration of 0.0127 ppm. Neither of these compounds are included in the limited number of SVOCs for which direct hazardous waste regulatory thresholds have been established. Additionally, both compounds were present at concentrations below the applicable U.S. EPA Region IX "Preliminary Remediation Goals (PRG)" values for residential soils.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area I B1-1D:

- 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 if it is applied to 22 CCR 66261.24(a)(7)
 - 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 B1-1D is NON-HAZARDOUS.

Outfall 009 Waste Characterization Sample Locations for B1-1C and B1-1D

Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Report Group Boundary
- NPDES Outfall
- A/C Paving
- Drainage
- Non Jurisdictional Surface Water Pathway
- Surface Water Divide
- Elevation Contour

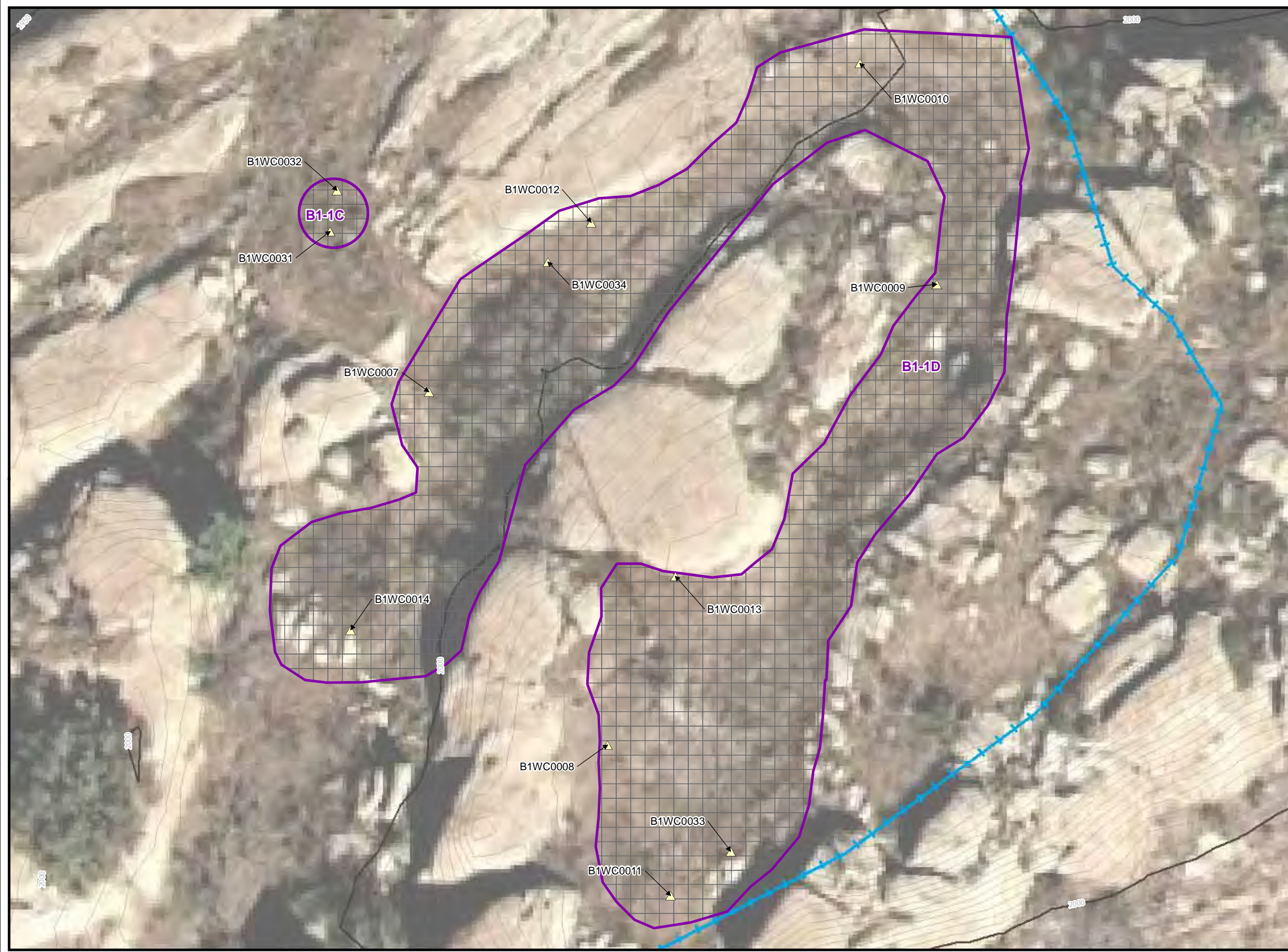
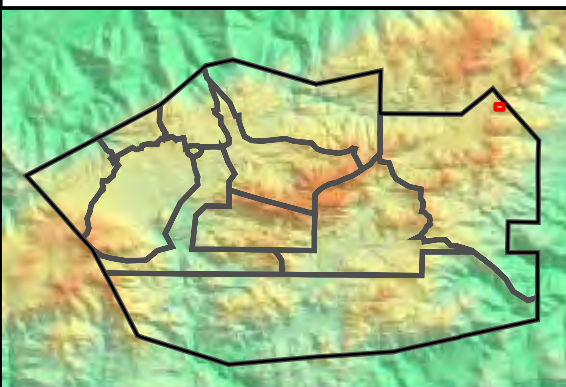
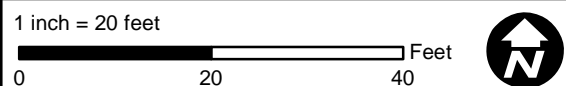
Base Map Legend

- ISRA Excavation Boundary
- Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_B1-1C&1D_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



SANTA SUSANA FIELD LABORATORY

FIGURE 1

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1D
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Object Name:	B1WC0007	B1WC0008	B1WC0009	B1WC0010	B1WC0011	B1WC0012	B1WC0013
Sample Name:	B1WC0007S001	B1WC0008S001	B1WC0009S001	B1WC0010S001	B1WC0011S001	B1WC0012S001	B1WC0013S001
Collection Date:	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010
Sample Depth (feet):	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0

ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c
METALS												
Antimony	mg/kg	500	150	--	--	0.245	0.24	0.252	0.153 J	0.198	0.19 J	0.195 J
Arsenic	mg/kg	500	50	100	--	5.15	6.29	4.96	4.94	6.97	4.72	5.32
Barium	mg/kg	10,000	1,000	2,000	--	90	90.2	92.3	78.3	80.8	79.7	83.7
Beryllium	mg/kg	75	7.5	--	--	0.521	0.725	0.419	0.431	0.571	0.464	0.576
Cadmium	mg/kg	100	10	20	--	0.198	0.0468 J	0.24	0.151	0.0974 J	0.16	0.127
Chromium	mg/kg	500	50	100	--	17.3	21.4	15.7	14.3	15.4	14	16.7
Cobalt	mg/kg	8,000	800	--	--	4.95	5.22	4.56	4.28	4.48	4.3	4.63
Copper	mg/kg	2,500	250	--	--	10.1	7.13	9.6	8.88	7.41	8.65	8.17
Lead	mg/kg	1,000	50	100	--	10.5	6.02	14.3	7.55	3.98	10.2	4.39
Mercury	mg/kg	20	2	4	--	3.82	<0.0109	<0.0112	<0.011	0.0151 J	<0.0114	0.0136 J
Mercury, WET	mg/L	--	--	--	0.2	0.0145	--	--	--	--	--	--
Molybdenum	mg/kg	3,500	3,500	--	--	0.647	0.955	0.521	0.437	0.54	0.495	0.728
Nickel	mg/kg	2,000	200	--	--	12.7	13.6	11.8	11	11.7	10.2	12.8
Selenium	mg/kg	100	10	20	--	0.23 J	0.216 J	0.135 J	0.117 J	0.16 J	0.164 J	0.142 J
Silver	mg/kg	500	50	100	--	0.0457 J	0.0354 J	0.0335 J	0.0251 J	0.0357 J	0.0358 J	0.0516 J
Thallium	mg/kg	700	70	--	--	0.266	0.234	0.197	0.173	0.209	0.194	0.192
Vanadium	mg/kg	2,400	240	--	--	31.8	41	28	26.2	29.5	25.4	30.7
Zinc	mg/kg	5,000	2,500	--	--	58.2	50.7	55.9	49.3	39.2	52.8	42.9
TPH												
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	--	<1 {<1}	<1 {<1}	<1 {<1}	<1 {<1}	<1 {<1}	<1 {<1}	<1 {<1}
EFH (C10 - C24)	mg/kg	--	--	--	--	<24 {<8}	<12 {<4}	5.2 J	<12 {<4}	<12 {<4}	4.4 J	<12 {<4}
EFH (C10 - C40)	mg/kg	--	--	--	--	17 J	5 J	41	10 J	5 J	20	4.9 J
EFH (C25 - C40)	mg/kg	--	--	--	--	13 J	<12 {<4}	36	6.4 J	<12 {<4}	16	<12 {<4}
SVOCs												
1,1'-Biphenyl	ug/kg	--	--	--	--	<333 {<100}	<332 {<99.5}	<333 {<99.8}	<333 {<99.9}	<333 {<99.9}	<333 {<99.9}	<331 {<99.4}
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
1-Naphthylamine	ug/kg	--	--	--	--	<333 {<100}	<332 {<99.5}	<333 {<99.8}	<333 {<99.9}	<333 {<99.9}	<333 {<99.9}	<331 {<99.4}
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
2,4-Dichlorophenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
2,4-Dimethylphenol	ug/kg	--	--	--	--	<333 {<117}	<332 {<116}	<333 {<116}	<333 {<117}	<333 {<117}	<333 {<117}	<331 {<116}
2,4-Dinitrophenol	ug/kg	--	--	--	--	<666 {<127}	<663 {<126}	<665 {<126}	<666 {<127}	<666 {<127}	<666 {<126}	<663 {<126}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1D
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Object Name:	B1WC0007	B1WC0008	B1WC0009	B1WC0010	B1WC0011	B1WC0012	B1WC0013
Sample Name:	B1WC0007S001	B1WC0008S001	B1WC0009S001	B1WC0010S001	B1WC0011S001	B1WC0012S001	B1WC0013S001
Collection Date:	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010
Sample Depth (feet):	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0

ANALYTE	UNITS	T TLC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<333 {<33.3}	<332 {<33.2}	<333 {<33.3}	<333 {<33.3}	<333 {<33.3}	<333 {<33.3}	<331 {<33.1}
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<333 {<33.3}	<332 {<33.2}	<333 {<33.3}	<333 {<33.3}	<333 {<33.3}	<333 {<33.3}	<331 {<33.1}
2-Chloronaphthalene	ug/kg	--	--	--	--	<33.3 {<11}	<33.2 {<10.9}	<33.3 {<11}	<33.3 {<11}	<33.3 {<11}	<33.3 {<11}	<33.1 {<10.9}
2-Chlorophenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
2-Methylnaphthalene	ug/kg	--	--	--	--	<33.3 {<6.66}	<33.2 {<6.63}	<33.3 {<6.65}	<33.3 {<6.66}	<33.3 {<6.66}	<33.3 {<6.66}	<33.1 {<6.63}
2-Methylphenol	ug/kg	--	--	200	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
2-Naphthylamine	ug/kg	--	--	--	--	<333 {<110}	<332 {<109}	<333 {<110}	<333 {<110}	<333 {<110}	<333 {<110}	<331 {<109}
2-Nitroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
2-Nitrophenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
3,3-Dichlorobenzidine	ug/kg	--	--	--	--	<333 {<100}	<332 {<99.5}	<333 {<99.8}	<333 {<99.9}	<333 {<99.9}	<333 {<99.9}	<331 {<99.4}
3-Nitroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
4-Aminobiphenyl	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
4-Chloroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
4-Chlorophenyl-phenylether	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
4-Methylphenol	ug/kg	--	--	200	--	<333 {<100}	<332 {<99.5}	<333 {<99.8}	<333 {<99.9}	<333 {<99.9}	<333 {<99.9}	<331 {<99.4}
4-Nitroaniline	ug/kg	--	--	--	--	<333 {<100}	<332 {<99.5}	<333 {<99.8}	<333 {<99.9}	<333 {<99.9}	<333 {<99.9}	<331 {<99.4}
4-Nitrophenol	ug/kg	--	--	--	--	<333 {<110}	<332 {<109}	<333 {<110}	<333 {<110}	<333 {<110}	<333 {<110}	<331 {<109}
Acenaphthene	ug/kg	--	--	--	--	<33.3 {<11}	<33.2 {<10.9}	<33.3 {<11}	<33.3 {<11}	<33.3 {<11}	<33.3 {<11}	<33.1 {<10.9}
Acenaphthylene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Acetophenone	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Anthracene	ug/kg	--	--	--	--	<33.3 {<6.66}	<33.2 {<6.63}	<33.3 {<6.65}	<33.3 {<6.66}	<33.3 {<6.66}	<33.3 {<6.66}	<33.1 {<6.63}
Atrazine	ug/kg	--	--	--	--	<333 {<100}	<332 {<99.5}	<333 {<99.8}	<333 {<99.9}	<333 {<99.9}	<333 {<99.9}	<331 {<99.4}
Benzaldehyde	ug/kg	--	--	--	--	<333 {<100}	<332 {<99.5}	<333 {<99.8}	<333 {<99.9}	<333 {<99.9}	<333 {<99.9}	<331 {<99.4}
Benzidine	ug/kg	--	--	--	--	<333 {<100}	<332 {<99.5}	<333 {<99.8}	<333 {<99.9}	<333 {<99.9}	<333 {<99.9}	<331 {<99.4}
Benzo(a)anthracene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Benzo(a)pyrene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Benzo(b)fluoranthene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Benzo(ghi)perylene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	207 J	72.4 J	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1D
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Object Name:	B1WC0007	B1WC0008	B1WC0009	B1WC0010	B1WC0011	B1WC0012	B1WC0013
Sample Name:	B1WC0007S001	B1WC0008S001	B1WC0009S001	B1WC0010S001	B1WC0011S001	B1WC0012S001	B1WC0013S001
Collection Date:	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010
Sample Depth (feet):	0.0 - 0.5	1.5 - 2.0	0.0 - 0.5	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0

ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c
Butyl benzyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Caprolactam	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Carbazole	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Chrysene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Dibenzofuran	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Diethyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Dimethyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Di-n-butyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Di-n-octyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Diphenylamine	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Fluoranthene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Fluorene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Hexachlorobenzene	ug/kg	--	--	2,600	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Hexachloroethane	ug/kg	--	--	60,000	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Isophorone	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Naphthalene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Nitrobenzene	ug/kg	--	--	40,000	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
n-Nitrosodimethylamine	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<333 {<83.3}	<332 {<82.9}	<333 {<83.1}	<333 {<83.3}	<333 {<83.3}	<333 {<83.2}	<331 {<82.8}
Phenanthrene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	<33.3 {<9.99}	<33.1 {<9.94}
Phenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
Pyrene	ug/kg	--	--	--	--	<33.3 {<10}	<33.2 {<9.95}	<33.3 {<9.98}	<33.3 {<9.99}	<33.3 {<9.99}	12.7 J	<33.1 {<9.94}
Pyridine	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.3}	<333 {<66.5}	<333 {<66.6}	<333 {<66.6}	<333 {<66.6}	<331 {<66.3}
RADIONUCLIDES	--	--	--	--	--	R	R	R	R	R	R	R

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1D
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0014	B1WC0033	B1WC0034
						Sample Name:	B1WC0014S001	B1WC0033S001	B1WC0034S001
						Collection Date:	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	0.5 - 1.0	1.0 - 1.5	1.0 - 1.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT^c	RESULT^c	RESULT^c	
METALS									
Antimony	mg/kg	500	150	--	--	0.202	<1.52	<1.65	
Arsenic	mg/kg	500	50	100	--	5.9	10.3	9.97	
Barium	mg/kg	10,000	1,000	2,000	--	108	75.6	51.9	
Beryllium	mg/kg	75	7.5	--	--	0.469	<0.0924	<0.1	
Cadmium	mg/kg	100	10	20	--	0.299	<0.0924	<0.1	
Chromium	mg/kg	500	50	100	--	17.1	14.1	14.1	
Cobalt	mg/kg	8,000	800	--	--	4.9	4.24	3.62	
Copper	mg/kg	2,500	250	--	--	10.7	8.57	10.9	
Lead	mg/kg	1,000	50	100	--	10.5	4.31	5.34	
Mercury	mg/kg	20	2	4	--	0.0112 J	0.0123	0.00859 J	
Mercury, WET	mg/L	--	--	--	0.2	--	--	--	
Molybdenum	mg/kg	3,500	3,500	--	--	0.658	0.794 J	0.762 J	
Nickel	mg/kg	2,000	200	--	--	12.5	10.2	8.16	
Selenium	mg/kg	100	10	20	--	0.214 J	6.23	7.74	
Silver	mg/kg	500	50	100	--	0.0503 J	<0.0924	<0.1	
Thallium	mg/kg	700	70	--	--	0.197	<0.462	<0.5	
Vanadium	mg/kg	2,400	240	--	--	29.8	30.6	29.1	
Zinc	mg/kg	5,000	2,500	--	--	61.4	51	47.6	
TPH									
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	--	<0.9 {<0.9}	<1 {<1}	<1 {<1}	
EFH (C10 - C24)	mg/kg	--	--	--	--	<12 {<4}	<12 {<4}	<12 {<4}	
EFH (C10 - C40)	mg/kg	--	--	--	--	32	7.2 J	6.3 J	
EFH (C25 - C40)	mg/kg	--	--	--	--	28	5.6 J	5.4 J	
SVOCs									
1,1'-Biphenyl	ug/kg	--	--	--	--	<167 {<50}	<332 {<99.5}	<332 {<99.5}	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
1-Naphthylamine	ug/kg	--	--	--	--	<167 {<50}	<332 {<99.5}	<332 {<99.5}	
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
2,4-Dichlorophenol	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
2,4-Dimethylphenol	ug/kg	--	--	--	--	<167 {<58.3}	<332 {<116}	<332 {<116}	
2,4-Dinitrophenol	ug/kg	--	--	--	--	<333 {<63.3}	<664 {<126}	<664 {<126}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1D
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0014	B1WC0033	B1WC0034
						Sample Name:	B1WC0014S001	B1WC0033S001	B1WC0034S001
						Collection Date:	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	0.5 - 1.0	1.0 - 1.5	1.0 - 1.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<167 {<16.7}	<332 {<33.2}	<332 {<33.2}	
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<167 {<16.7}	<332 {<33.2}	<332 {<33.2}	
2-Chloronaphthalene	ug/kg	--	--	--	--	<16.7 {<5.5}	<33.2 {<10.9}	<33.2 {<10.9}	
2-Chlorophenol	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
2-Methylnaphthalene	ug/kg	--	--	--	--	<16.7 {<3.33}	<33.2 {<6.64}	<33.2 {<6.64}	
2-Methylphenol	ug/kg	--	--	200	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
2-Naphthylamine	ug/kg	--	--	--	--	<167 {<55}	<332 {<109}	<332 {<109}	
2-Nitroaniline	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
2-Nitrophenol	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
3,3-Dichlorobenzidine	ug/kg	--	--	--	--	<167 {<50}	<332 {<99.5}	<332 {<99.5}	
3-Nitroaniline	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
4-Aminobiphenyl	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
4-Chloroaniline	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
4-Chlorophenyl-phenylether	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
4-Methylphenol	ug/kg	--	--	200	--	<167 {<50}	<332 {<99.5}	<332 {<99.5}	
4-Nitroaniline	ug/kg	--	--	--	--	<167 {<50}	<332 {<99.5}	<332 {<99.5}	
4-Nitrophenol	ug/kg	--	--	--	--	<167 {<55}	<332 {<109}	<332 {<109}	
Acenaphthene	ug/kg	--	--	--	--	<16.7 {<5.5}	<33.2 {<10.9}	<33.2 {<10.9}	
Acenaphthylene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Acetophenone	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Anthracene	ug/kg	--	--	--	--	<16.7 {<3.33}	<33.2 {<6.64}	<33.2 {<6.64}	
Atrazine	ug/kg	--	--	--	--	<167 {<50}	<332 {<99.5}	<332 {<99.5}	
Benzaldehyde	ug/kg	--	--	--	--	<167 {<50}	<332 {<99.5}	<332 {<99.5}	
Benzidine	ug/kg	--	--	--	--	<167 {<50}	<332 {<99.5}	<332 {<99.5}	
Benzo(a)anthracene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Benzo(a)pyrene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Benzo(b)fluoranthene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Benzo(ghi)perylene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1D
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0014	B1WC0033	B1WC0034
						Sample Name:	B1WC0014S001	B1WC0033S001	B1WC0034S001
						Collection Date:	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	0.5 - 1.0	1.0 - 1.5	1.0 - 1.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT^c	RESULT^c	RESULT^c	
Butyl benzyl phthalate	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Caprolactam	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Carbazole	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Chrysene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Dibenzofuran	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Diethyl phthalate	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Dimethyl phthalate	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Di-n-butyl phthalate	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Di-n-octyl phthalate	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Diphenylamine	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Fluoranthene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Fluorene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Hexachlorobenzene	ug/kg	--	--	2,600	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Hexachloroethane	ug/kg	--	--	60,000	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Isophorone	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Naphthalene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Nitrobenzene	ug/kg	--	--	40,000	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
n-Nitrosodimethylamine	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<167 {<41.7}	<332 {<82.9}	<332 {<82.9}	
Phenanthrene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Phenol	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
Pyrene	ug/kg	--	--	--	--	<16.7 {<5}	<33.2 {<9.95}	<33.2 {<9.95}	
Pyridine	ug/kg	--	--	--	--	<167 {<33.3}	<332 {<66.4}	<332 {<66.4}	
RADIONUCLIDES	--	--	--	--	--	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1 AND B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

H - Analytical holding time was exceeded.

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

SU - Standard Units

**ISRA 009 – B1-1.
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of the 26 samples taken at the ISRA Outfall 009, B1-1 area. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹.

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 ~0.037 pCi/g and ~0.037 pCi/g respectively. Minimum detectable activity for tritium averaged ~0.9 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.

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.

Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from B1-1 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 0.229 +/- 0.0522 pCi/g which is statistically identical to the highest background result of 0.21 +/- 0.04 pCi/g. The highest non-background subtracted Cs-137 result is equivalent to an effective dose of 0.16 mrem/y⁶.

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/>.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from B1-1 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 0.064 pCi/g which is less than the highest background result of 0.13 pCi/g. The highest non-background subtracted Sr-90 result is equivalent to an effective dose of 0.02 mrem/y⁶.

Tritium - All tritium results are non-detect, the average tritium result is -0.152 pCi/g and the highest tritium result is 0.894 pCi/g. The highest non-detected, non-background subtracted tritium result is equivalent to an effective dose of 0.013 mrem/y⁶.

This waste is certified to be “radiologically” acceptable for shipment to, and disposal at, any waste disposal facility. The waste requires no further radiological controls.

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 B1-1 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 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.

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 8 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>

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*”



Phil Rutherford
Manager, Health, Safety & Radiation Services

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)	0.00
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:	26
Z-value for Alpha	1.645
Critical Value	2142
Sum of Reference Ranks	2321

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	0.041
Max	0.213	0.229
Min	0.015	-0.034
σ	0.062	0.077
$m-1.96\sigma$	-0.035	-0.111
$m+1.96\sigma$	0.210	0.192

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1		0.092	0.092	R	48	48
2		0.020	0.020	R	23	23
3		0.020	0.020	R	23	23
4		0.100	0.100	R	53.5	53.5
5		0.020	0.020	R	23	23
6		0.158	0.158	R	66.5	66.5
7		0.175	0.175	R	69	69
8		0.209	0.209	R	75	75
9		0.180	0.180	R	70	70
10		0.030	0.030	R	31	31
11		0.213	0.213	R	76	76
12		0.025	0.025	R	28	28
13		0.020	0.020	R	23	23
14		0.020	0.020	R	23	23
15		0.074	0.074	R	43	43
16		0.147	0.147	R	61	61
17		0.100	0.100	R	53.5	53.5

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
18		0.067	0.067	R	41.5	41.5
19		0.099	0.099	R	52	52
20		0.101	0.101	R	55	55
21		0.148	0.148	R	62	62
22		0.153	0.153	R	64	64
23		0.025	0.025	R	28	28
24		0.188	0.188	R	71	71
25		0.198	0.198	R	73	73
26		0.030	0.030	R	31	31
27		0.079	0.079	R	45	45
28		0.158	0.158	R	66.5	66.5
29		0.109	0.109	R	56	56
30		0.059	0.059	R	39	39
31		0.067	0.067	R	41.5	41.5
32		0.113	0.113	R	57	57
33		0.015	0.015	R	18	18
34		0.031	0.031	R	34	34
35		0.042	0.042	R	37	37
36		0.097	0.097	R	50.5	50.5
37		0.015	0.015	R	18	18
38		0.020	0.020	R	23	23
39		0.085	0.085	R	47	47
40		0.080	0.080	R	46	46
41		0.015	0.015	R	18	18
42		0.020	0.020	R	23	23
43		0.035	0.035	R	35.5	35.5
44		0.035	0.035	R	35.5	35.5
45		0.025	0.025	R	28	28
46		0.150	0.150	R	63	63
47		0.140	0.140	R	59.5	59.5
48		0.190	0.190	R	72	72
49		0.097	0.097	R	50.5	50.5
50		0.030	0.030	R	31	31
51		0.140	0.140	R	59.5	59.5
52	B1WC0001S001	-0.015	-0.015	S	7	0
53	B1WC0002S001	0.065	0.065	S	40	0
54	B1WC0003S001	-0.005	-0.005	S	10	0
55	B1WC0004S001	0.207	0.207	S	74	0
56	B1WC0005S001	0.229	0.229	S	77	0
57	B1WC0006S001	0.008	0.008	S	15	0
58	B1WC0007S001	0.078	0.078	S	44	0
59	B1WC0008S001	-0.010	-0.010	S	8	0
60	B1WC0009S001	0.031	0.031	S	33	0
61	B1WC0010S001	-0.002	-0.002	S	12	0
62	B1WC0011S001	0.007	0.007	S	14	0
63	B1WC0012S001	0.127	0.127	S	58	0
64	B1WC0013S001	-0.034	-0.034	S	1	0
65	B1WC0014S001	-0.023	-0.023	S	3	0
66	B1WC0015S001	-0.018	-0.018	S	5	0
67	B1WC0016S001	0.056	0.056	S	38	0
68	B1WC0017S001	-0.019	-0.019	S	4	0
69	B1WC0018S001	-0.031	-0.031	S	2	0
70	B1WC0027S001	-0.016	-0.016	S	6	0
71	B1WC0028S001	-0.004	-0.004	S	11	0
72	B1WC0029S001	0.172	0.172	S	68	0
73	B1WC0030S001	0.092	0.092	S	49	0
74	B1WC0031S001	0.000	0.000	S	13	0
75	B1WC0032S001	0.156	0.156	S	65	0
76	B1WC0033S001	-0.009	-0.009	S	9	0

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
77	B1WC0034S001	0.011	0.011	S	16	0
Sum					3003	2321

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, Ho, is: Survey sample concentrations exceed those in the background

The alternative hypothesis, Ha, 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)	0.00
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:	26
Z-value for Alpha	1.645
Critical Value	2142
Sum of Reference Ranks	2495

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	0.016
Max	0.130	0.064
Min	0.005	-0.011
σ	0.030	0.017
$m-1.96\sigma$	-0.008	-0.017
$m+1.96\sigma$	0.109	0.048

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1		0.030	0.030	R	33	33
2		0.010	0.010	R	13.5	13.5
3		0.045	0.045	R	51.5	51.5
4		0.045	0.045	R	51.5	51.5
5		0.050	0.050	R	61	61
6		0.040	0.040	R	42	42
7		0.035	0.035	R	37.5	37.5
8		0.050	0.050	R	61	61
9		0.050	0.050	R	61	61
10		0.130	0.130	R	76.5	76.5
11		0.120	0.120	R	75	75
12		0.040	0.040	R	42	42
13		0.045	0.045	R	51.5	51.5
14		0.130	0.130	R	76.5	76.5
15		0.050	0.050	R	61	61
16		0.088	0.088	R	70	70
17		0.080	0.080	R	67	67
18		0.100	0.100	R	74	74
19		0.069	0.069	R	66	66
20		0.097	0.097	R	72	72

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
21		0.084	0.084	R	69	69
22		0.098	0.098	R	73	73
23		0.045	0.045	R	51.5	51.5
24		0.045	0.045	R	51.5	51.5
25		0.020	0.020	R	23	23
26		0.045	0.045	R	51.5	51.5
27		0.089	0.089	R	71	71
28		0.050	0.050	R	61	61
29		0.045	0.045	R	51.5	51.5
30		0.050	0.050	R	61	61
31		0.045	0.045	R	51.5	51.5
32		0.040	0.040	R	42	42
33		0.045	0.045	R	51.5	51.5
34		0.045	0.045	R	51.5	51.5
35		0.045	0.045	R	51.5	51.5
36		0.025	0.025	R	29.5	29.5
37		0.082	0.082	R	68	68
38		0.045	0.045	R	51.5	51.5
39		0.040	0.040	R	42	42
40		0.035	0.035	R	37.5	37.5
41		0.025	0.025	R	29.5	29.5
42		0.005	0.005	R	7	7
43		0.020	0.020	R	23	23
44		0.010	0.010	R	13.5	13.5
45		0.020	0.020	R	23	23
46		0.020	0.020	R	23	23
47		0.050	0.050	R	61	61
48		0.030	0.030	R	33	33
49		0.030	0.030	R	33	33
50		0.020	0.020	R	23	23
51		0.040	0.040	R	42	42
52	B1WC0001S001	0.021	0.021	S	27	0
53	B1WC0002S001	0.008	0.008	S	11	0
54	B1WC0003S001	-0.006	-0.006	S	3	0
55	B1WC0004S001	0.027	0.027	S	31	0
56	B1WC0005S001	0.032	0.032	S	35	0
57	B1WC0006S001	0.020	0.020	S	26	0
58	B1WC0007S001	0.004	0.004	S	6	0
59	B1WC0008S001	0.015	0.015	S	17	0
60	B1WC0009S001	0.009	0.009	S	12	0
61	B1WC0010S001	0.018	0.018	S	18	0
62	B1WC0011S001	0.004	0.004	S	5	0
63	B1WC0012S001	0.033	0.033	S	36	0
64	B1WC0013S001	-0.002	-0.002	S	4	0
65	B1WC0014S001	0.006	0.006	S	8	0
66	B1WC0015S001	-0.011	-0.011	S	1	0
67	B1WC0016S001	0.019	0.019	S	19	0
68	B1WC0017S001	0.013	0.013	S	15	0
69	B1WC0018S001	0.006	0.006	S	10	0
70	B1WC0027S001	0.041	0.041	S	45	0
71	B1WC0028S001	-0.008	-0.008	S	2	0
72	B1WC0029S001	0.020	0.020	S	20	0
73	B1WC0030S001	0.036	0.036	S	39	0
74	B1WC0031S001	0.064	0.064	S	65	0
75	B1WC0032S001	0.022	0.022	S	28	0
76	B1WC0033S001	0.015	0.015	S	16	0
77	B1WC0034S001	0.006	0.006	S	9	0
Sum					3003	2495

Soil Data from ISRA 009 - B1-1

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	B1WC0001S001	N/A	4/28/2010	251959	-0.0149	0.0213	0.0355	NDA	0.0213	0.0228	0.0376	NDA	-0.103	0.637	1.1	NDA
2	B1WC0002S001	N/A	4/28/2010	251959	0.0651	0.0311	0.0399		0.00755	0.0181	0.0334	NDA	-0.552	0.626	1.11	NDA
3	B1WC0003S001	N/A	4/28/2010	251959	-0.00529	0.0225	0.0388	NDA	-0.00558	0.0148	0.0328	NDA	-0.241	0.633	1.1	NDA
4	B1WC0004S001	N/A	4/28/2010	251959	0.207	0.0387	0.0313		0.0268	0.0237	0.0379	NDA	-0.14	0.646	1.12	NDA
5	B1WC0005S001	N/A	4/28/2010	251959	0.229	0.0522	0.0406		0.0318	0.0219	0.0329	NDA	-0.776	0.624	1.11	NDA
6	B1WC0006S001	N/A	4/28/2010	251959	0.00762	0.02	0.0352	NDA	0.0203	0.0185	0.0294	NDA	-0.312	0.636	1.11	NDA
7	B1WC0007S001	N/A	4/27/2010	251902	0.0779	0.0302	0.0385		0.00422	0.0182	0.0345	NDA	-0.376	0.534	0.95	NDA
8	B1WC0008S001	N/A	4/27/2010	251902	-0.0102	0.0251	0.0431	NDA	0.0153	0.0221	0.0384	NDA	-0.39	0.519	0.924	NDA
9	B1WC0009S001	N/A	4/27/2010	251902	0.0308	0.0203	0.0385	NDA	0.00905	0.0214	0.039	NDA	-0.341	0.512	0.911	NDA
10	B1WC0010S001	N/A	4/27/2010	251902	-0.00238	0.0251	0.0416	NDA	0.0183	0.0239	0.0408	NDA	-0.0613	0.551	0.959	NDA
11	B1WC0011S001	N/A	4/27/2010	251902	0.00685	0.0205	0.0366	NDA	0.00409	0.0205	0.0397	NDA	-0.569	0.514	0.927	NDA
12	B1WC0012S001	N/A	4/27/2010	251902	0.127	0.0464	0.0422		0.0332	0.0272	0.0427	NDA	-0.229	0.535	0.943	NDA
13	B1WC0013S001	N/A	4/27/2010	251902	-0.034	0.0294	0.0446	NDA	-0.00199	0.018	0.0368	NDA	-0.194	0.539	0.947	NDA
14	B1WC0014S001	N/A	4/28/2010	251959	-0.0229	0.0231	0.0416	NDA	0.00564	0.0131	0.0241	NDA	0.894	0.674	1.12	NDA
15	B1WC0015S001	N/A	4/28/2010	251959	-0.0176	0.0188	0.0321	NDA	-0.0113	0.017	0.0379	NDA	-0.759	0.62	1.11	NDA
16	B1WC0016S001	N/A	4/28/2010	251959	0.0564	0.0238	0.0337		0.0192	0.0204	0.0336	NDA	-0.419	0.621	1.09	NDA
17	B1WC0017S001	N/A	4/28/2010	251959	-0.0186	0.0196	0.0324	NDA	0.0125	0.0216	0.0383	NDA	-0.196	0.638	1.11	NDA
18	B1WC0018S001	N/A	4/28/2010	251959	-0.0313	0.0218	0.0346	NDA	0.00619	0.0218	0.0401	NDA	-0.498	0.633	1.12	NDA
19	B1WC0027S001	N/A	6/17/2010	254961	-0.0156	0.0216	0.0351	NDA	0.0406	0.0268	0.0424	NDA	0	0.358	0.654	NDA
20	B1WC0028S001	N/A	6/17/2010	254961	-0.00437	0.0175	0.0308	NDA	-0.00768	0.0212	0.0398	NDA	0.206	0.366	0.633	NDA
21	B1WC0029S001	N/A	6/17/2010	255142	0.172	0.051	0.0501		0.0195	0.0247	0.0421	NDA	0.285	0.374	0.636	NDA
22	B1WC0030S001	N/A	6/17/2010	255142	0.0922	0.0231	0.0282		0.0357	0.0242	0.0387	NDA	0.36	0.387	0.647	NDA
23	B1WC0031S001	N/A	6/17/2010	255145	0	0.0311	0.0299	NDA	0.0644	0.0261	0.0325		0.0176	0.356	0.648	NDA
24	B1WC0032S001	N/A	6/17/2010	255145	0.156	0.0408	0.0393		0.0215	0.0182	0.0291	NDA	0.116	0.345	0.611	NDA
25	B1WC0033S001	N/A	6/17/2010	255146	-0.00858	0.0203	0.0347	NDA	0.0151	0.0232	0.0399	NDA	0.189	0.363	0.632	NDA
26	B1WC0034S001	N/A	6/17/2010	255146	0.0114	0.0216	0.0383	NDA	0.00576	0.0231	0.0409	NDA	0.137	0.359	0.633	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	0.041	0.037		0.016	0.037		-0.152	0.918	
Maximum	0.229	0.050		0.064	0.043		0.894	1.120	
Minimum	-0.034	0.028		-0.011	0.024		-0.776	0.611	
Count			26			26			26
Number of Non-Detects			17			25			26
% Non-Detects			65%			96%			100%

Appendix 2
Radionuclide Results

ISRA Outfall 009 - B1-1

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
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Americium-241	0.0141	0.0726	0.122	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Americium-241	0.0653	0.101	0.17	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Americium-241	0.0906	0.111	0.192	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Americium-241	0.0386	0.0569	0.0995	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Americium-241	-0.0182	0.0335	0.0582	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Americium-241	0.113	0.0815	0.143	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Americium-241	-0.00849	0.13	0.221	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Americium-241	0	0.191	0.324	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Americium-241	-0.0505	0.121	0.225	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Americium-241	0.12	0.0932	0.161	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Americium-241	0.0719	0.07	0.117	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Americium-241	0.0368	0.0373	0.0653	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Americium-241	0.0276	0.033	0.0544	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Americium-241	-0.0181	0.0244	0.0404	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Americium-241	-0.17	0.0897	0.164	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Americium-241	-0.0348	0.0561	0.104	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Americium-241	-0.0645	0.0747	0.143	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Americium-241	-0.0164	0.115	0.22	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Americium-241	-0.0429	0.0907	0.177	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Americium-241	0.028	0.0614	0.105	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Americium-241	0.0934	0.218	0.359	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Americium-241	-0.14	0.0986	0.164	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Americium-241	0.00347	0.0729	0.123	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Americium-241	0.0182	0.0275	0.0455	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Americium-241	0.0145	0.11	0.208	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Americium-241	-0.102	0.071	0.127	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Cesium-134	0	0.0457	0.053	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Cesium-134	0	0.0528	0.0611	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Cesium-134	0	0.0405	0.0606	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Cesium-134	0	0.0265	0.0446	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Cesium-134	0	0.0421	0.0628	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Cesium-134	0	0.0366	0.0514	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Cesium-134	0	0.0438	0.0575	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Cesium-134	0	0.0467	0.0633	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Cesium-134	0	0.0415	0.0561	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Cesium-134	0	0.048	0.0585	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Cesium-134	0	0.0427	0.0553	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Cesium-134	0	0.0446	0.0605	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Cesium-134	0	0.0505	0.0728	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Cesium-134	0	0.0346	0.0486	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Cesium-134	0	0.0284	0.0479	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Cesium-134	0	0.0315	0.0449	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Cesium-134	0.0479	0.0445	0.0495	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Cesium-134	0	0.0356	0.0492	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Cesium-134	0	0.0296	0.0512	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Cesium-134	0	0.0363	0.0507	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Cesium-134	0	0.0502	0.0682	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Cesium-134	0	0.0287	0.0437	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Cesium-134	0	0.0251	0.0431	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Cesium-134	0	0.0346	0.0544	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Cesium-134	0	0.0414	0.058	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Cesium-134	0	0.0449	0.0569	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Cesium-137	-0.0149	0.0213	0.0355	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Cesium-137	0.0651	0.0311	0.0399	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Cesium-137	-0.00529	0.0225	0.0388	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Cesium-137	0.207	0.0387	0.0313	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Cesium-137	0.229	0.0522	0.0406	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Cesium-137	0.00762	0.02	0.0352	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Cesium-137	0.0779	0.0302	0.0385	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Cesium-137	-0.0102	0.0251	0.0431	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Cesium-137	0.0308	0.0203	0.0385	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Cesium-137	-0.00238	0.0251	0.0416	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Cesium-137	0.00685	0.0205	0.0366	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	25190	

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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
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Cesium-137	0.127	0.0464	0.0422		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Cesium-137	-0.034	0.0294	0.0446	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Cesium-137	-0.0229	0.0231	0.0416	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Cesium-137	-0.0176	0.0188	0.0321	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Cesium-137	0.0564	0.0238	0.0337		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Cesium-137	-0.0186	0.0196	0.0324	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Cesium-137	-0.0313	0.0218	0.0346	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Cesium-137	-0.0156	0.0216	0.0351	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Cesium-137	-0.00437	0.0175	0.0308	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Cesium-137	0.172	0.051	0.0501		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Cesium-137	0.0922	0.0231	0.0282		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Cesium-137	0	0.0311	0.0299	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Cesium-137	0.156	0.0408	0.0393		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Cesium-137	-0.00858	0.0203	0.0347	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Cesium-137	0.0114	0.0216	0.0383	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Cobalt-60	-0.0021	0.0205	0.0347	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Cobalt-60	-0.000866	0.0223	0.0383	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Cobalt-60	-0.0116	0.0276	0.0423	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Cobalt-60	0.00611	0.0186	0.0323	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Cobalt-60	0.0108	0.0252	0.0457	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Cobalt-60	0.00962	0.02	0.0351	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Cobalt-60	0.0145	0.0219	0.0399	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Cobalt-60	0.00252	0.028	0.0469	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Cobalt-60	-0.00997	0.0231	0.0382	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Cobalt-60	-0.0204	0.0241	0.0376	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Cobalt-60	-0.0104	0.0209	0.0328	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Cobalt-60	-0.0142	0.0279	0.0458	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Cobalt-60	-0.0224	0.026	0.0397	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Cobalt-60	-0.00898	0.0208	0.0342	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Cobalt-60	0.00884	0.0193	0.0347	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Cobalt-60	-0.00795	0.0195	0.0313	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Cobalt-60	0.0121	0.0214	0.0384	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Cobalt-60	0.0045	0.0203	0.0357	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Cobalt-60	-0.0242	0.0225	0.0346	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Cobalt-60	-0.0169	0.0199	0.0306	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Cobalt-60	0.00125	0.0274	0.0459	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Cobalt-60	-0.00666	0.0188	0.031	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Cobalt-60	0.00236	0.0193	0.0331	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Cobalt-60	-0.0023	0.0226	0.038	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Cobalt-60	0.00301	0.022	0.0378	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Cobalt-60	0.0112	0.0192	0.0344	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Europium-152	-0.0273	0.0847	0.0867	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Europium-152	-0.0033	0.0692	0.0994	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Europium-152	-0.0803	0.061	0.1	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Europium-152	-0.00557	0.0448	0.0776	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Europium-152	0.0164	0.0536	0.0963	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Europium-152	-0.0146	0.0635	0.0921	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Europium-152	-0.0283	0.0598	0.0911	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Europium-152	-0.0328	0.0879	0.124	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Europium-152	-0.00152	0.0553	0.0906	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Europium-152	-0.0403	0.0553	0.0933	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Europium-152	-0.0116	0.0556	0.089	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Europium-152	-0.0358	0.0658	0.0996	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Europium-152	-0.0341	0.0567	0.0947	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Europium-152	0.028	0.0449	0.0817	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Europium-152	-0.0492	0.0663	0.094	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Europium-152	-0.00387	0.0463	0.0826	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Europium-152	-0.00554	0.0686	0.0843	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Europium-152	-0.00859	0.0507	0.0837	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Europium-152	-0.00402	0.0568	0.0949	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Europium-152	-0.00859	0.0446	0.0793	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Europium-152	0.0212	0.0942	0.138	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH																

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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
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Europium-152	0.0196	0.0677	0.0847	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Europium-152	0.00844	0.0478	0.0811	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Europium-152	-0.00677	0.0595	0.0915	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Europium-152	-0.0326	0.0692	0.0915	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Europium-154	-0.0221	0.0686	0.115	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Europium-154	-0.016	0.0822	0.137	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Europium-154	-0.0528	0.0802	0.129	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Europium-154	0.0563	0.0582	0.105	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Europium-154	-0.0182	0.0799	0.131	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Europium-154	0.00392	0.0669	0.115	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Europium-154	-0.00866	0.0737	0.127	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Europium-154	-0.016	0.0821	0.135	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Europium-154	-0.0774	0.0744	0.114	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Europium-154	-0.0108	0.0769	0.128	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Europium-154	-0.0496	0.0726	0.114	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Europium-154	0.0239	0.0884	0.151	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Europium-154	-0.0893	0.0934	0.146	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Europium-154	0.00774	0.0636	0.11	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Europium-154	-0.0113	0.0657	0.114	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Europium-154	-0.0686	0.0609	0.092	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Europium-154	0.0128	0.0625	0.11	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Europium-154	-0.0269	0.0659	0.111	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Europium-154	-0.00666	0.0696	0.119	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Europium-154	0.0378	0.0589	0.103	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Europium-154	0.0186	0.0944	0.16	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Europium-154	-0.0705	0.059	0.0923	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Europium-154	-0.028	0.0586	0.098	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Europium-154	-0.00342	0.0749	0.127	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Europium-154	-0.00345	0.0686	0.117	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Europium-154	-0.0282	0.0623	0.103	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Manganese-54	-0.0286	0.0211	0.0327	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Manganese-54	0.0028	0.0222	0.0387	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Manganese-54	0.0133	0.0215	0.0381	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Manganese-54	0.00427	0.0165	0.0299	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Manganese-54	-0.0312	0.0241	0.0385	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Manganese-54	-0.00136	0.0193	0.0337	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Manganese-54	0.0108	0.0212	0.0378	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Manganese-54	0.0066	0.0249	0.0437	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Manganese-54	0.0119	0.0213	0.0378	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Manganese-54	-0.00848	0.0249	0.0397	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Manganese-54	0.00631	0.0203	0.0356	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Manganese-54	0.0521	0.0275	0.0529	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Manganese-54	0.00686	0.0281	0.0493	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Manganese-54	-0.00144	0.0195	0.0336	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Manganese-54	0.00793	0.0215	0.0333	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Manganese-54	-0.0144	0.019	0.0317	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Manganese-54	0.00162	0.0192	0.0332	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Manganese-54	0.00249	0.0198	0.0346	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Manganese-54	0.00788	0.0213	0.0376	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Manganese-54	0.0149	0.0175	0.032	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Manganese-54	0.017	0.0283	0.0505	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Manganese-54	-0.012	0.0174	0.0288	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Manganese-54	0.00408	0.0185	0.0326	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Manganese-54	-0.00896	0.0218	0.0367	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Manganese-54	0.00369	0.0228	0.0394	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Manganese-54	0.00403	0.0213	0.0366	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Potassium-40	22.3	2.14	2.83	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Potassium-40	20	2.01	3.55	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Potassium-40	21.5	2.24	3.42	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Potassium-40	21.5	2.01	2.47	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Potassium-40	21.1	2.14	3.55	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Potassium-40	23	2.25	2.95	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Potassium-40										

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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
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Potassium-40	21.5	2.32	0.419		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Potassium-40	23.4	0.988	0.306		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Potassium-40	24.4	2.44	0.295		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Potassium-40	22	2.12	0.314		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Potassium-40	21.2	2.2	0.332		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Potassium-40	23.1	2.34	0.376		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Potassium-40	20.2	1.89	0.218		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Potassium-40	21.5	2.45	0.284		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Potassium-40	21.8	2.06	0.182		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Potassium-40	19.8	1.95	0.296		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Potassium-40	20.8	1.74	0.267		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Potassium-40	21.4	2.22	0.296		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Potassium-40	22.5	2.11	0.226		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Potassium-40	25.2	2.69	0.433		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Potassium-40	22.9	2.35	0.249		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Potassium-40	23.3	2.24	0.219		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Potassium-40	23	2.16	0.289		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Potassium-40	21.8	2.2	0.276		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Potassium-40	21.3	2.07	0.311		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Sodium-22	-0.00694	0.0241	0.0407	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Sodium-22	-0.00696	0.0288	0.0479	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Sodium-22	-0.0239	0.0285	0.0452	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Sodium-22	0.0187	0.0203	0.0368	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Sodium-22	-0.0112	0.0284	0.0458	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Sodium-22	0.0019	0.0235	0.0406	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Sodium-22	-0.00763	0.0262	0.0444	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Sodium-22	-0.00212	0.0287	0.0475	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Sodium-22	-0.0262	0.026	0.04	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Sodium-22	-0.00378	0.027	0.0449	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Sodium-22	-0.0142	0.0252	0.0399	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Sodium-22	-0.00898	0.0327	0.0528	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Sodium-22	-0.031	0.0327	0.0513	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Sodium-22	-0.00688	0.023	0.0386	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Sodium-22	-0.00397	0.0231	0.04	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Sodium-22	-0.0267	0.0216	0.0323	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Sodium-22	0.0073	0.0218	0.0386	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Sodium-22	-0.0116	0.0233	0.0389	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Sodium-22	-0.00142	0.0245	0.0419	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Sodium-22	0.018	0.0204	0.0364	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Sodium-22	-0.00604	0.0339	0.0561	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Sodium-22	-0.0244	0.0207	0.0325	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Sodium-22	-0.00928	0.0206	0.0345	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Sodium-22	-0.00583	0.0265	0.0445	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Sodium-22	-0.00193	0.024	0.0409	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Sodium-22	-0.00989	0.0219	0.0362	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Strontium-90	0.0213	0.0228	0.0376	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Strontium-90	0.00755	0.0181	0.0334	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Strontium-90	-0.00558	0.0148	0.0328	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Strontium-90	0.0268	0.0237	0.0379	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Strontium-90	0.0318	0.0219	0.0329	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Strontium-90	0.0203	0.0185	0.0294	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Strontium-90	0.00422	0.0182	0.0345	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Strontium-90	0.0153	0.0221	0.0384	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Strontium-90	0.00905	0.0214	0.039	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Strontium-90	0.0183	0.0239	0.0408	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Strontium-90	0.00409	0.0205	0.0397	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Strontium-90	0.0332	0.0272	0.0427	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Strontium-90	-0.00199	0.018	0.0368	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Strontium-90	0.00564	0.0131	0.0241	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Strontium-90	-0.0113	0.017	0.0379	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Strontium-90	0.0192	0.0204	0.0336	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Strontium-90	0.0125	0.0216	0.0383	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Strontium-90	0.00619	0.0216	0.0401	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251959	Waste

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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
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Strontium-90	0.0406	0.0268	0.0424	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Strontium-90	-0.00768	0.0212	0.0398	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Strontium-90	0.0195	0.0247	0.0421	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Strontium-90	0.0357	0.0242	0.0387	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Strontium-90	0.0644	0.0261	0.0325	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Strontium-90	0.0215	0.0182	0.0291	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Strontium-90	0.0151	0.0232	0.0399	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Strontium-90	0.00576	0.0231	0.0409	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Thorium-228	1.37	0.143	0.0523		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Thorium-228	1.41	0.158	0.0585		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Thorium-228	1.31	0.149	0.06		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Thorium-228	1.25	0.18	0.0446		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Thorium-228	1.12	0.128	0.0565		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Thorium-228	1.5	0.206	0.0591		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Thorium-228	1.42	0.131	0.053		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Thorium-228	1.54	0.199	0.0735		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Thorium-228	1.42	0.0667	0.0556		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Thorium-228	1.34	0.143	0.0592		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Thorium-228	1.62	0.183	0.0534		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Thorium-228	1.4	0.157	0.0558		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Thorium-228	1.51	0.165	0.0567		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Thorium-228	1.26	0.151	0.0445		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Thorium-228	1.26	0.136	0.0561		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Thorium-228	1.33	0.152	0.0489		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Thorium-228	1.21	0.127	0.0494		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Thorium-228	1.28	0.12	0.0519		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Thorium-228	1.35	0.179	0.0553		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Thorium-228	1.34	0.152	0.0448		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Thorium-228	1.93	0.246	0.0822		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Thorium-228	1.33	0.141	0.0468		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Thorium-228	1.41	0.192	0.0515		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Thorium-228	1.39	0.167	0.0456		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Thorium-228	1.37	0.159	0.0578		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Thorium-228	1.5	0.155	0.054		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Thorium-232	1.5	0.258	0.141		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Thorium-232	1.5	0.262	0.129		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Thorium-232	1.39	0.26	0.149		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Thorium-232	1.33	0.226	0.103		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Thorium-232	1.35	0.243	0.151		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Thorium-232	1.52	0.254	0.124		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Thorium-232	1.45	0.262	0.13		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Thorium-232	1.61	0.29	0.15		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Thorium-232	1.37	0.185	0.138		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Thorium-232	1.35	0.262	0.139		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Thorium-232	1.65	0.276	0.126		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Thorium-232	1.4	0.265	0.166		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Thorium-232	1.61	0.319	0.181		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Thorium-232	1.23	0.217	0.119		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Thorium-232	1.41	0.271	0.125		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Thorium-232	1.3	0.213	0.114		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Thorium-232	1.44	0.253	0.116		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Thorium-232	1.28	0.23	0.118		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Thorium-232	1.32	0.247	0.132		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Thorium-232	1.42	0.23	0.113		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Thorium-232	1.96	0.329	0.165		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Thorium-232	1.3	0.227	0.107		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Thorium-232	1.38	0.243	0.116		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Thorium-232	1.36	0.228	0.127		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Thorium-232	1.49	0.257	0.13		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Thorium-232	1.76	0.287	0.121		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Tritium	-0.103	0.637	1.1	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Tritium	-0.552	0.626	1.1	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Tritium	-0.241	0.633	1.1	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste










ISRA Outfall 009 - B1-1



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
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Tritium	-0.14	0.646	1.12	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Tritium	-0.776	0.624	1.11	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Tritium	-0.312	0.636	1.11	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Tritium	-0.376	0.534	0.95	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Tritium	-0.39	0.519	0.924	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Tritium	-0.341	0.512	0.911	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Tritium	-0.0613	0.551	0.959	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Tritium	-0.569	0.514	0.927	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Tritium	-0.229	0.535	0.943	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Tritium	-0.194	0.539	0.947	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Tritium	0.894	0.674	1.12	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Tritium	-0.759	0.62	1.11	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Tritium	-0.419	0.621	1.09	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Tritium	-0.196	0.638	1.11	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Tritium	-0.498	0.633	1.12	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Tritium	0	0.358	0.654	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Tritium	0.206	0.366	0.633	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Tritium	0.285	0.374	0.636	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Tritium	0.36	0.387	0.647	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Tritium	0.0176	0.356	0.648	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Tritium	0.116	0.345	0.611	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Tritium	0.189	0.363	0.632	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Tritium	0.137	0.359	0.633	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Uranium-235	0.123	0.114	0.204	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Uranium-235	0.117	0.126	0.227	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Uranium-235	0.0362	0.129	0.225	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Uranium-235	0.0777	0.086	0.159	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Uranium-235	-0.0204	0.111	0.193	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Uranium-235	0.153	0.121	0.216	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Uranium-235	0.0328	0.109	0.196	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Uranium-235	0.0716	0.159	0.262	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Uranium-235	0.122	0.115	0.203	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Uranium-235	-0.0135	0.126	0.211	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Uranium-235	0.0524	0.12	0.203	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Uranium-235	0.0461	0.121	0.212	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Uranium-235	0.00409	0.105	0.189	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Uranium-235	0.0165	0.0818	0.149	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Uranium-235	-0.00945	0.122	0.214	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Uranium-235	0.133	0.13	0.168	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Uranium-235	0.0533	0.109	0.195	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Uranium-235	0.0443	0.109	0.192	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Uranium-235	0.152	0.121	0.214	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Uranium-235	0.0227	0.1	0.173	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Uranium-235	0.000738	0.177	0.305	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Uranium-235	-0.0202	0.105	0.176	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Uranium-235	-0.00435	0.108	0.19	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Uranium-235	0.118	0.115	0.151	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Uranium-235	0.0845	0.118	0.216	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Uranium-235	0.0168	0.115	0.204	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0001	B1WC0001S001	Soil	Uranium-238	1.9	0.874	1.11	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0002	B1WC0002S001	Soil	Uranium-238	1.78	1.22	1.41	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0003	B1WC0003S001	Soil	Uranium-238	1.27	1.26	1.55	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0004	B1WC0004S001	Soil	Uranium-238	1.04	0.771	0.835	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0005	B1WC0005S001	Soil	Uranium-238	0.78	0.577	0.595	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0006	B1WC0006S001	Soil	Uranium-238	1.05	1	1.19	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0007	B1WC0007S001	Soil	Uranium-238	1.75	1.38	1.78	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0008	B1WC0008S001	Soil	Uranium-238	2.41	1.86	2.45	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0009	B1WC0009S001	Soil	Uranium-238	0.818	1.02	1.88	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0010	B1WC0010S001	Soil	Uranium-238	1.33	1.07	1.29	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0011	B1WC0011S001	Soil	Uranium-238	0.941	0.879	1.05	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0012	B1WC0012S001	Soil	Uranium-238	0.763	0.534	0.656	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	B1-1	B1WC0013	B1WC0013S001	Soil	Uranium-238	1.2	0.565	0.545	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251902	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0014	B1WC0014S001	Soil	Uranium-238	0.868	0.456	0.419	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste

ISRA Outfall 009 - B1-1

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
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0015	B1WC0015S001	Soil	Uranium-238	0.256	0.793	1.49	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0016	B1WC0016S001	Soil	Uranium-238	0.574	0.569	1.06	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0017	B1WC0017S001	Soil	Uranium-238	0.283	0.697	1.31	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	B1-1	B1WC0018	B1WC0018S001	Soil	Uranium-238	-0.0636	0.991	1.81	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251959	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0027	B1WC0027S001	Soil	Uranium-238	0.679	0.86	1.65	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1A	B1WC0028	B1WC0028S001	Soil	Uranium-238	0.979	0.82	0.934		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	254961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0029	B1WC0029S001	Soil	Uranium-238	2.27	1.94	2.74	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1B	B1WC0030	B1WC0030S001	Soil	Uranium-238	0.577	0.816	1.5	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255142	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0031	B1WC0031S001	Soil	Uranium-238	1.61	0.977	1.07		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1C	B1WC0032	B1WC0032S001	Soil	Uranium-238	0.783	0.474	0.439		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255145	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0033	B1WC0033S001	Soil	Uranium-238	0.322	0.945	1.77	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-1D	B1WC0034	B1WC0034S001	Soil	Uranium-238	0.766	0.647	1.21	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255146	Waste

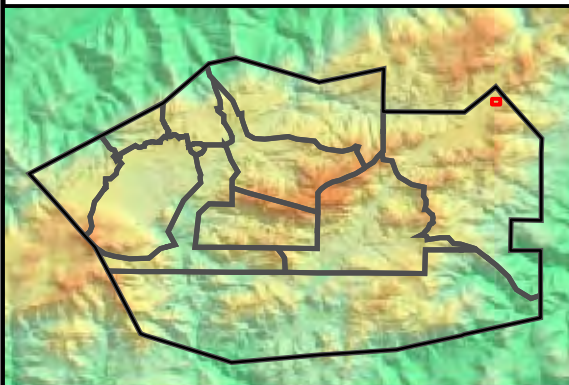
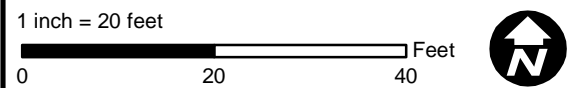
Outfall 009 Waste Characterization Sample Locations for B1-1A

- Base Map Legend**
-  Administrative Area Boundary
 -  RFI Site Boundary
 -  Report Group Boundary
 -  NPDES Outfall
 -  A/C Paving
 -  Drainage
 -  Non Jurisdictional Surface Water Pathway
 -  Surface Water Divide
 -  Elevation Contour

- Base Map Legend**
-  ISRA Excavation Boundary
 -  Waste Characterization Sample Location

- Note:**
1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
 2. Aerial imagery from Google Earth, 2010.
 3. Topographic contours from Lidar data, 2008.










Document: ISRA_Plots_SP_B1-1A_SampleLocations_062110_WC.mxd Date: Jun 21, 2010





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

FIGURE 1

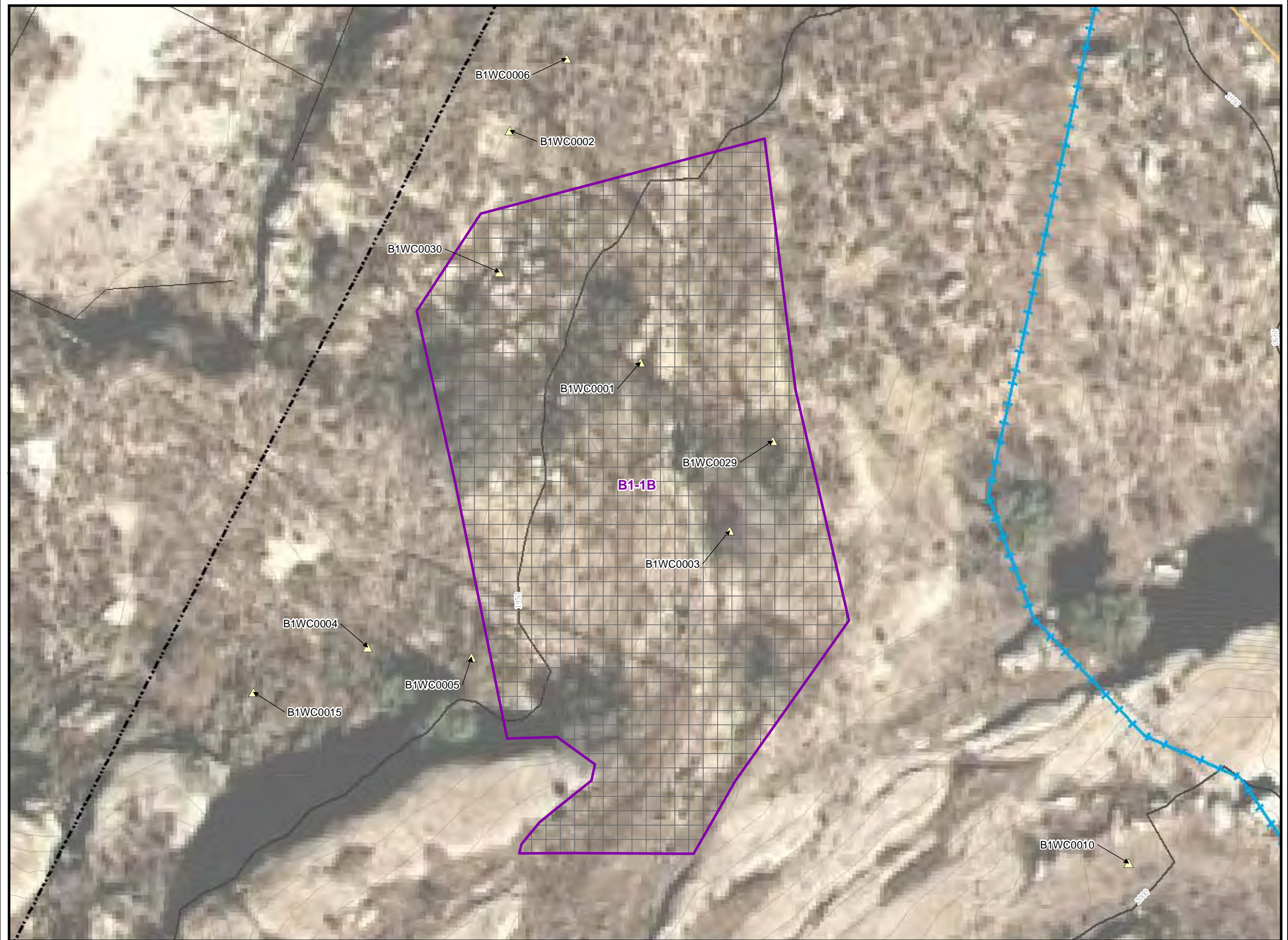
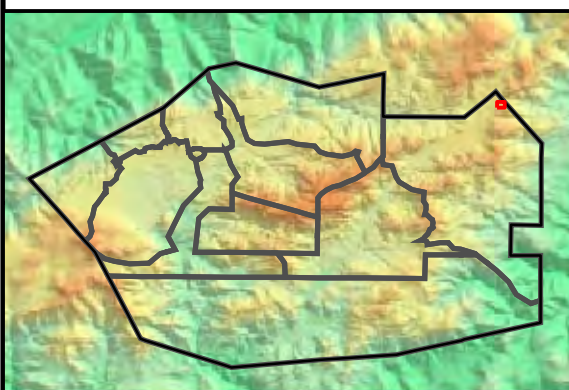
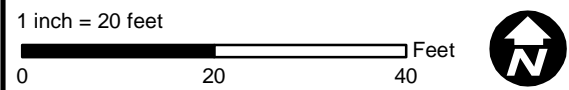
Outfall 009 Waste Characterization Sample Locations for B1-1B

- Base Map Legend**
-  Administrative Area Boundary
 -  RFI Site Boundary
 -  Report Group Boundary
 -  NPDES Outfall
 -  A/C Paving
 -  Drainage
 -  Non Jurisdictional Surface Water Pathway
 -  Surface Water Divide
 -  Elevation Contour

- Base Map Legend**
-  ISRA Excavation Boundary
 -  Waste Characterization Sample Location











- Note:**
1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
 2. Aerial imagery from Google Earth, 2010.
 3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_B1-1B_SampleLocations_062110_WC.mxd Date: Jun 21, 2010





Outfall 009 Waste Characterization Sample Locations for B1-1C and B1-1D

Base Map Legend

-  Administrative Area Boundary
-  Boundary
-  RFI Site Boundary
-  Report Group Boundary
-  NPDES Outfall
-  A/C Paving
-  Drainage
-  Non Jurisdictional Surface Water Pathway
-  Surface Water Divide
-  Elevation Contour

Base Map Legend

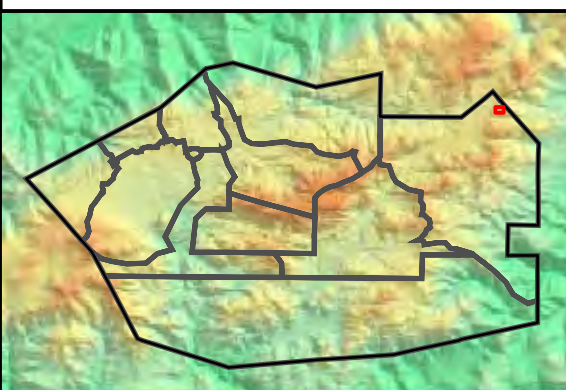
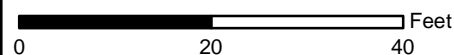
-  ISRA Excavation Boundary
-  Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_B1-1C&1D_SampleLocations_062110_WC.mxd Date: Jun 21, 2010

1 inch = 20 feet



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

FIGURE 1

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA OUTFALL 009 PLANNED EXCAVATION B1-2

Introduction

This report presents supporting detailed information for the April 30, 2010 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area I, near the former B-1 engine test facility.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area I 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 I 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 guidelines presented in U.S. EPA SW-846 are followed in evaluating the adequacy of sampling and the application of analytical results to regulatory thresholds. 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. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation at B1-2 was based partly on the Group 1A RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals, Petroleum Hydrocarbons (TPH), Volatile Organic Compounds (VOC), and Semi-Volatile Organic Compounds (SVOC) should be addressed in the B1-2 excavation footprint.

Initially, twelve (12) sample collection points were randomly identified within the planned excavation footprint. The samples were analyzed for CAM 17 Regulated Metals, TPH, VOCs, and SVOCs. Only two samples were analyzed for VOC presence because the probability of volatiles remaining in shallow soils over extended periods of time was considered to be low. Following excavation of soil from the planned B1-2 footprint, analysis of confirmation samples indicated that soil remediation goals were not attained in some areas within the footprint. Additional follow-up excavation was carried out. Some soil from outside the original excavation footprint was removed at this time, requiring further waste characterization. This soil was segregated in an isolated stockpile and four samples were collected from randomly identified locations within it. The same analytical suite was employed as during the first round of waste characterization sampling, with the addition of Polychlorinated Biphenyls (PCB).

During all phases of waste characterization sampling, samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the B1-2 planned excavation area are presented in GEL Laboratories reports 252089 issued on 5/12/10, 252784 issued on 5/19/10, and 254951 issued on 6/29/10. The follow-up excavation stockpile sampling results are presented in Test America report ITI0270 issued on 10/1/10.

Results from the first round of sampling demonstrated that Regulated Metals were far below 10-Times their respective California Soluble Threshold Limits (STLC) in all cases, with the exception of one sample that exhibited Lead at 65.8 parts per million (ppm). This is slightly above the 50 ppm 10X STLC threshold. The Lead concentrations in the other 11 samples ranged between 4.31 ppm and 28.3 ppm. Subsequent analysis of the elevated sample, by the California Waste Extraction Test (WET) for leaching properties as required, resulted in a concentration of 2.49 milligrams per liter (mg/L), well below the 5 mg/L STLC hazardous waste limit.

Low concentrations of TPH were detected. These TPH detections ranged between 20 ppm and 410 ppm. All of the detections that exceeded 100 ppm were related to heavier, oil type petroleum hydrocarbon fractions in the C25 through C40 carbon range. Consequently, the TPH concentrations detected in the planned B1-2 excavation area are below permit limits generally set for Municipal Solid Waste landfills in California. Gasoline range Petroleum Hydrocarbons were not detected.

No VOCs were detected. Very low concentrations of some SVOCs were detected in the soil samples from B1-2, none of which were above the parts per billion level. Specific hazardous waste thresholds have been established in the regulations for only a small number of SVOCs. There were no exceedances of established limits. Furthermore, none of the detected SVOCs exceeded U.S. EPA Region IX "Preliminary Remediation Goals" values for residential soils.

The follow-up sampling again resulted in the detection of low concentrations of Regulated Metals for all but one sample. In this case, Mercury was detected at 2.0 ppm, at the 10X STLC threshold. However, the WET performed on this sample did not detect Mercury in the leachate. All other Regulated Metals were well below their respective 10X STLC thresholds. TPH concentrations did not exceed 53 ppm and Gasoline range Petroleum Hydrocarbons were not detected. Trace concentrations of Acetone were detected in two samples but did not exceed 0.21 ppm. Methyl Ethyl Ketone was another VOC detected at 0.024 ppm in one of the samples that also contained Acetone. In this same sample, p-Isopropyltoluene was detected at 0.00086 ppm. Trace concentrations of SVOCs (Polycyclic Aromatic Hydrocarbons) were detected in one sample only, but as with the first round of sampling, all concentrations were well below 1 ppm. No PCBs were detected.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area I B1-2, and additional follow-up excavation soil associated with it:

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 if it is applied to 22 CCR 66261.24(a)(7)
 - 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 B1-2 is NON-HAZARDOUS.

Outfall 009 Waste Characterization Sample Locations for B1-2

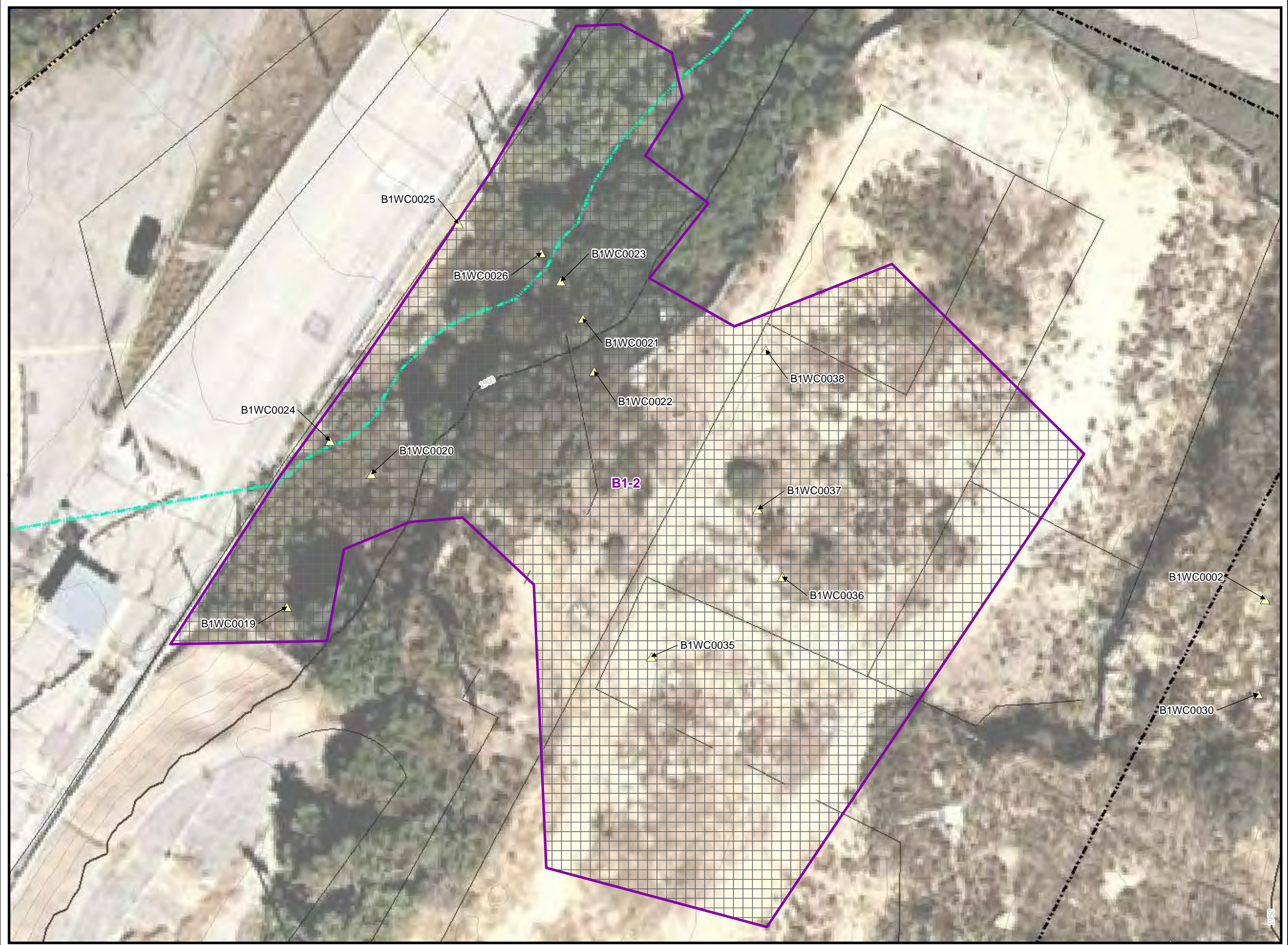
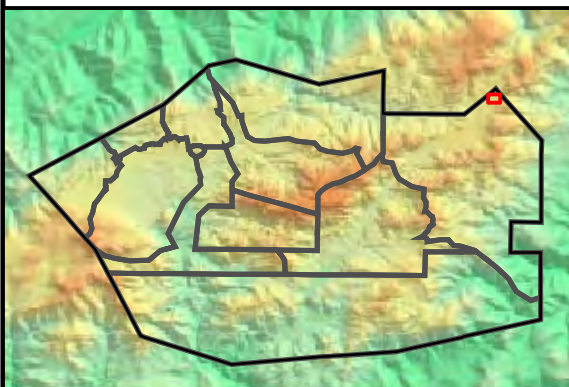
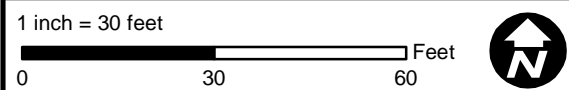
- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Base Map Legend**
- ISRA Excavation Boundary
 - Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_B1-2_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



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

FIGURE 1

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	B1WC0019	B1WC0020	B1WC0021	B1WC0022	B1WC0023	B1WC0024	B1WC0025	
				Sample Name:	B1WC0019S001	B1WC0020S001	B1WC0021S001	B1WC0022S001	B1WC0023S001	B1WC0024S001	B1WC0025S001	
				Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	
				Sample Depth (feet):	1.0 - 1.5	1.5 - 2.0	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5	
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
METALS												
Antimony	mg/kg	500	150	--	--	0.16 J	0.121 J	0.197	0.0998 J	0.112 J	0.114 J	0.104 J
Arsenic	mg/kg	500	50	100	--	6.75	5.42	7.39	6.5	5.72	7.94	17.3
Barium	mg/kg	10,000	1,000	2,000	--	77.5	75.2	106	78.2	65.2	59.2	79.9
Beryllium	mg/kg	75	7.5	--	--	0.525	0.465	0.74	0.626	0.491	0.433	0.706
Cadmium	mg/kg	100	10	20	--	0.0482 J	0.0913 J	0.312	0.0688 J	0.635	0.477	0.0818 J
Chromium	mg/kg	500	50	100	--	21.5	22.1	29.5	19.3	18.6	19.3	22.1
Cobalt	mg/kg	8,000	800	--	--	6.69	5.75	8.4	5.72	5.56	5.09	7
Copper	mg/kg	2,500	250	--	--	9.57	9.99	19.5	9.66	11	10.4	10.3
Lead	mg/kg	1,000	50	100	--	6.54	8.34	20	5.9	28.3	65.8	15.2
Lead, WET	mg/L	--	--	--	5	--	--	--	--	--	2.49	--
Mercury	mg/kg	20	2	4	--	0.0235 J	0.0282 J	0.0393 J	0.0251 J	0.0563 J	0.049 J	0.0259 J
Molybdenum	mg/kg	3,500	3,500	--	--	0.552	0.426	1.03	0.643	0.557	0.566	0.49
Nickel	mg/kg	2,000	200	--	--	14.1	11.1	26.7	11.6	12.2	10.6	15.4
Selenium	mg/kg	100	10	20	--	0.324 J	0.185 J	0.186 J	0.153 J	0.138 J	0.108 J	0.096 J
Silver	mg/kg	500	50	100	--	0.049 J	0.0277 J	0.0864 J	0.0276 J	0.0445 J	0.0446 J	0.0574 J
Thallium	mg/kg	700	70	--	--	0.247	0.226	0.285	0.255	0.218	0.186	0.234
Vanadium	mg/kg	2,400	240	--	--	34.4	31.4	32.9	27	27.4	26.3	29.6
Zinc	mg/kg	5,000	2,500	--	--	54	62.4	126	55.8	73.9	131	57.2
TPH												
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	--	<10 {<10}	<1 {<1}	<1 {<1}	<1 {<1}	<9.3 {<9.3}	<9.9 {<9.9}	<9.1 {<9.1}
EFH (C10 - C24)	mg/kg	--	--	--	--	31	<12 {<4}	5.5 J	<12 {<4}	18 J	18 J	<12 {<4}
EFH (C10 - C40)	mg/kg	--	--	--	--	410	21	93	20	350	340	28
EFH (C25 - C40)	mg/kg	--	--	--	--	380	20	88	19	330	320	26
VOCs												
1,1,1-Trichloroethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	--	--	--	--	--	<5 {<1.6}	--	<5 {<1.6}	--	--	--
1,1,2-Trichloroethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,1-Dichloroethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,1-Dichloroethene	ug/kg	--	--	14,000	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,2-Dichlorobenzene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,2-Dichloroethane	ug/kg	--	--	10,000	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--
1,2-Dichloropropane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	--

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	B1WC0019	B1WC0020	B1WC0021	B1WC0022	B1WC0023	B1WC0024	B1WC0025
				Sample Name:	B1WC0019S001	B1WC0020S001	B1WC0021S001	B1WC0022S001	B1WC0023S001	B1WC0024S001	B1WC0025S001
				Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010
				Sample Depth (feet):	1.0 - 1.5	1.5 - 2.0	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
1,3-Dichlorobenzene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
1,4-Dichlorobenzene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
2-Butanone (MEK)	ug/kg	--	--	4,000,000	--	--	<5 {<1.5}	--	<5 {<1.5}	--	--
2-Hexanone	ug/kg	--	--	--	--	--	<5 {<1.5}	--	<5 {<1.5}	--	--
Acetone	ug/kg	--	--	--	--	--	<5 {<1.66}	--	<5 {<1.66}	--	--
Benzene	ug/kg	--	--	10,000	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Bromodichloromethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Bromoform	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Carbon Disulfide	ug/kg	--	--	--	--	--	<5 {<1.25}	--	<5 {<1.25}	--	--
Carbon Tetrachloride	ug/kg	--	--	10,000	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Chlorobenzene	ug/kg	--	--	2,000,000	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Chloroethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Chloroform	ug/kg	--	--	120,000	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Chloromethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
cis-1,2-Dichloroethene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
cis-1,3-Dichloropropene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Cyclohexane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Dibromochloromethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Dichlorodifluoromethane	ug/kg	--	--	--	--	--	<1 {<0.34}	--	<1 {<0.34}	--	--
Ethylbenzene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Hexachlorobutadiene	ug/kg	--	--	--	--	--	<1 {<66.5}	--	<1 {<66.3}	--	--
Isopropylbenzene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Methyl acetate	ug/kg	--	--	--	--	--	<5 {<1.66}	--	<5 {<1.66}	--	--
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Methylcyclohexane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Methylene chloride	ug/kg	--	--	--	--	--	<5 {<2}	--	<5 {<2}	--	--
m,p-Xylenes	ug/kg	--	--	--	--	--	<2 {<0.3}	--	<2 {<0.3}	--	--
o-Xylene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Styrene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Tetrachloroethene	ug/kg	--	--	14,000	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Tetrahydrofuran	ug/kg	--	--	--	--	--	<5 {<1.7}	--	<5 {<1.7}	--	--
Toluene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
trans-1,2-Dichloroethene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
trans-1,3-Dichloropropene	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	--	--	<1 {<0.33}	--	<1 {<0.33}	--	--
Trichlorofluoromethane	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	B1WC0019	B1WC0020	B1WC0021	B1WC0022	B1WC0023	B1WC0024	B1WC0025	
				Sample Name:	B1WC0019S001	B1WC0020S001	B1WC0021S001	B1WC0022S001	B1WC0023S001	B1WC0024S001	B1WC0025S001	
				Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	
				Sample Depth (feet):	1.0 - 1.5	1.5 - 2.0	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5	
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Vinyl acetate	ug/kg	--	--	--	--	--	<5 {<1.25}	--	<5 {<1.25}	--	--	
Vinyl chloride	ug/kg	--	--	4,000	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	
Xylenes, Total	ug/kg	--	--	--	--	--	<1 {<0.3}	--	<1 {<0.3}	--	--	
SVOCs												
1,1'-Biphenyl	ug/kg	--	--	--	--	<333 {<99.9}	<332 {<99.7}	<333 {<99.8}	<332 {<99.5}	<332 {<99.6}	<333 {<99.8}	<332 {<99.6}
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
1-Naphthylamine	ug/kg	--	--	--	--	<333 {<99.9}	<332 {<99.7}	<333 {<99.8}	<332 {<99.5}	<332 {<99.6}	<333 {<99.8}	<332 {<99.6}
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
2,4-Dichlorophenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
2,4-Dimethylphenol	ug/kg	--	--	--	--	<333 {<117}	<332 {<116}	<333 {<116}	<332 {<116}	<332 {<116}	<333 {<116}	<332 {<116}
2,4-Dinitrophenol	ug/kg	--	--	--	--	<666 {<127}	<665 {<126}	<665 {<126}	<663 {<126}	<664 {<126}	<665 {<126}	<664 {<126}
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<333 {<33.3}	<332 {<33.2}	<333 {<33.3}	<332 {<33.2}	<332 {<33.2}	<333 {<33.3}	<332 {<33.2}
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<333 {<33.3}	<332 {<33.2}	<333 {<33.3}	<332 {<33.2}	<332 {<33.2}	<333 {<33.3}	<332 {<33.2}
2-Chloronaphthalene	ug/kg	--	--	--	--	<33.3 {<11}	<33.2 {<11}	<33.3 {<11}	<33.2 {<10.9}	<33.2 {<11}	<33.3 {<11}	<33.2 {<11}
2-Chlorophenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
2-Methylnaphthalene	ug/kg	--	--	--	--	<33.3 {<6.66}	<33.2 {<6.65}	<33.3 {<6.65}	<33.2 {<6.63}	<33.2 {<6.64}	<33.3 {<6.65}	<33.2 {<6.64}
2-Methylphenol	ug/kg	--	--	200	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
2-Naphthylamine	ug/kg	--	--	--	--	<333 {<110}	<332 {<110}	<333 {<110}	<332 {<109}	<332 {<110}	<333 {<110}	<332 {<110}
2-Nitroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
2-Nitrophenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
3,3-Dichlorobenzidine	ug/kg	--	--	--	--	<333 {<99.9}	<332 {<99.7}	<333 {<99.8}	<332 {<99.5}	<332 {<99.6}	<333 {<99.8}	<332 {<99.6}
3-Nitroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
4-Aminobiphenyl	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
4-Chloroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
4-Chlorophenyl-phenylether	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
4-Methylphenol	ug/kg	--	--	200	--	<333 {<99.9}	<332 {<99.7}	<333 {<99.8}	<332 {<99.5}	<332 {<99.6}	<333 {<99.8}	<332 {<99.6}
4-Nitroaniline	ug/kg	--	--	--	--	<333 {<99.9}	<332 {<99.7}	<333 {<99.8}	<332 {<99.5}	<332 {<99.6}	<333 {<99.8}	<332 {<99.6}
4-Nitrophenol	ug/kg	--	--	--	--	<333 {<110}	<332 {<110}	<333 {<110}	<332 {<109}	<332 {<110}	<333 {<110}	<332 {<110}
Acenaphthene	ug/kg	--	--	--	--	<33.3 {<11}	<33.2 {<11}	<33.3 {<11}	<33.2 {<10.9}	<33.2 {<11}	<33.3 {<11}	<33.2 {<11}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0019	B1WC0020	B1WC0021	B1WC0022	B1WC0023	B1WC0024	B1WC0025
						Sample Name:	B1WC0019S001	B1WC0020S001	B1WC0021S001	B1WC0022S001	B1WC0023S001	B1WC0024S001	B1WC0025S001
						Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010
						Sample Depth (feet):	1.0 - 1.5	1.5 - 2.0	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Acenaphthylene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	<33.3 {<9.98}	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Acetophenone	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Anthracene	ug/kg	--	--	--	--	<33.3 {<6.66}	<33.2 {<6.65}	<33.3 {<6.65}	<33.2 {<6.63}	<33.2 {<6.64}	<33.3 {<6.65}	<33.2 {<6.64}	
Atrazine	ug/kg	--	--	--	--	<333 {<99.9}	<332 {<99.7}	<333 {<99.8}	<332 {<99.5}	<332 {<99.6}	<333 {<99.8}	<332 {<99.6}	
Benzaldehyde	ug/kg	--	--	--	--	<333 {<99.9}	<332 {<99.7}	<333 {<99.8}	<332 {<99.5}	<332 {<99.6}	<333 {<99.8}	<332 {<99.6}	
Benzidine	ug/kg	--	--	--	--	<333 {<99.9}	<332 {<99.7}	<333 {<99.8}	<332 {<99.5}	<332 {<99.6}	<333 {<99.8}	<332 {<99.6}	
Benzo(a)anthracene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	<33.3 {<9.98}	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Benzo(a)pyrene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	30.6 J	<33.2 {<9.95}	<33.2 {<9.96}	26.4 J	25.8 J	
Benzo(b)fluoranthene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	42	<33.2 {<9.95}	<33.2 {<9.96}	27.4 J	32.4 J	
Benzo(ghi)perylene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	<33.3 {<9.98}	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	<33.3 {<9.98}	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Butyl benzyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Caprolactam	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Carbazole	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	<33.3 {<9.98}	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Chrysene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	25.7 J	<33.2 {<9.95}	<33.2 {<9.96}	16.4 J	23.7 J	
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	<33.3 {<9.98}	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Dibenzofuran	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Diethyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Dimethyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Di-n-butyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Di-n-octyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Diphenylamine	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Fluoranthene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	37	<33.2 {<9.95}	<33.2 {<9.96}	21.3 J	40	
Fluorene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	<33.3 {<9.98}	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Hexachlorobenzene	ug/kg	--	--	2,600	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Hexachloroethane	ug/kg	--	--	60,000	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	57	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Isophorone	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	
Naphthalene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	<33.3 {<9.98}	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}	
Nitrobenzene	ug/kg	--	--	40,000	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	B1WC0019	B1WC0020	B1WC0021	B1WC0022	B1WC0023	B1WC0024	B1WC0025	
				Sample Name:	B1WC0019S001	B1WC0020S001	B1WC0021S001	B1WC0022S001	B1WC0023S001	B1WC0024S001	B1WC0025S001	
				Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	4/30/2010	
				Sample Depth (feet):	1.0 - 1.5	1.5 - 2.0	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.0 - 0.5	
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	
n-Nitrosodimethylamine	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<333 {<83.3}	<332 {<83.1}	<333 {<83.1}	<332 {<82.9}	<332 {<83}	<333 {<83.1}	<332 {<83}
Phenanthrene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	16.4 J	<33.2 {<9.95}	<33.2 {<9.96}	<33.3 {<9.98}	<33.2 {<9.96}
Phenol	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
Pyrene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.2 {<9.97}	31.5 J	<33.2 {<9.95}	<33.2 {<9.96}	22.8 J	35
Pyridine	ug/kg	--	--	--	--	<333 {<66.6}	<332 {<66.5}	<333 {<66.5}	<332 {<66.3}	<332 {<66.4}	<333 {<66.5}	<332 {<66.4}
RADIONUCLIDES	--	--	--	--	--	R	R	R	R	R	R	R

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0026	B1WC0035	B1WC0036	B1WC0037	B1WC0038
						Sample Name:	B1WC0026S001	B1WC0035S001	B1WC0036S001	B1WC0037S001	B1WC0038S001
						Collection Date:	4/30/2010	6/17/2010	6/17/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
METALS											
Antimony	mg/kg	500	150	--	--	0.159 J	<1.61	<1.57	<0.319	<1.53	
Arsenic	mg/kg	500	50	100	--	7.79	10.3	10.1	12.4	10.3	
Barium	mg/kg	10,000	1,000	2,000	--	79.9	83.6	62	75.5	73	
Beryllium	mg/kg	75	7.5	--	--	0.549	<0.0978	<0.0951	<0.0965	<0.0926	
Cadmium	mg/kg	100	10	20	--	0.147	<0.0978	<0.475	<0.0965	0.117 J	
Chromium	mg/kg	500	50	100	--	17.8	21.1	17.1	19.3	17.8	
Cobalt	mg/kg	8,000	800	--	--	5.5	6.26	4.54	6.4	5.95	
Copper	mg/kg	2,500	250	--	--	9.08	23.5	8.56	13.3	11.6	
Lead	mg/kg	1,000	50	100	--	9.68	14.2	4.31	8.29	8.3	
Lead, WET	mg/L	--	--	--	5	--	--	--	--	--	
Mercury	mg/kg	20	2	4	--	0.0331 J	0.223	0.029	0.536	0.0708	
Molybdenum	mg/kg	3,500	3,500	--	--	0.664	0.797 J	0.948 J	1.13	1.27	
Nickel	mg/kg	2,000	200	--	--	10.9	12.9	8.28	11.3	10.1	
Selenium	mg/kg	100	10	20	--	0.151 J	9.23	7.5	8.83	6.4	
Silver	mg/kg	500	50	100	--	0.0378 J	7.88	<0.0951	1.08 J	<0.463	
Thallium	mg/kg	700	70	--	--	0.217	<0.489	<0.475	<2.41	<0.463	
Vanadium	mg/kg	2,400	240	--	--	29.7	33.6	35.8	35.9	33.1	
Zinc	mg/kg	5,000	2,500	--	--	55.2	101	47	64.2	59	
TPH											
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	--	<0.9 {<0.9}	<1 {<1}	<1 {<1}	<1 {<1}	<10 {<10}	
EFH (C10 - C24)	mg/kg	--	--	--	--	4.4 J	4.7 J	<12 {<4}	<12 {<4}	9 J	
EFH (C10 - C40)	mg/kg	--	--	--	--	130	62	86	63	320	
EFH (C25 - C40)	mg/kg	--	--	--	--	130	57	83	62	310	
VOCs											
1,1,1-Trichloroethane	ug/kg	--	--	--	--	--	--	--	--	--	
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	--	--	--	--	--	--	
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	--	--	--	--	--	--	--	--	--	
1,1,2-Trichloroethane	ug/kg	--	--	--	--	--	--	--	--	--	
1,1-Dichloroethane	ug/kg	--	--	--	--	--	--	--	--	--	
1,1-Dichloroethene	ug/kg	--	--	14,000	--	--	--	--	--	--	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	--	--	--	--	--	
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	--	--	--	--	--	--	
1,2-Dichlorobenzene	ug/kg	--	--	--	--	--	--	--	--	--	
1,2-Dichloroethane	ug/kg	--	--	10,000	--	--	--	--	--	--	
1,2-Dichloropropane	ug/kg	--	--	--	--	--	--	--	--	--	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
 THE BOEING COMPANY
 SANTA SUSANA FIELD LABORATORY

						Object Name:	B1WC0026	B1WC0035	B1WC0036	B1WC0037	B1WC0038
						Sample Name:	B1WC0026S001	B1WC0035S001	B1WC0036S001	B1WC0037S001	B1WC0038S001
						Collection Date:	4/30/2010	6/17/2010	6/17/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
1,3-Dichlorobenzene	ug/kg	--	--	--	--	--	--	--	--	--	
1,4-Dichlorobenzene	ug/kg	--	--	--	--	--	--	--	--	--	
2-Butanone (MEK)	ug/kg	--	--	4,000,000	--	--	--	--	--	--	
2-Hexanone	ug/kg	--	--	--	--	--	--	--	--	--	
Acetone	ug/kg	--	--	--	--	--	--	--	--	--	
Benzene	ug/kg	--	--	10,000	--	--	--	--	--	--	
Bromodichloromethane	ug/kg	--	--	--	--	--	--	--	--	--	
Bromoform	ug/kg	--	--	--	--	--	--	--	--	--	
Carbon Disulfide	ug/kg	--	--	--	--	--	--	--	--	--	
Carbon Tetrachloride	ug/kg	--	--	10,000	--	--	--	--	--	--	
Chlorobenzene	ug/kg	--	--	2,000,000	--	--	--	--	--	--	
Chloroethane	ug/kg	--	--	--	--	--	--	--	--	--	
Chloroform	ug/kg	--	--	120,000	--	--	--	--	--	--	
Chloromethane	ug/kg	--	--	--	--	--	--	--	--	--	
cis-1,2-Dichloroethene	ug/kg	--	--	--	--	--	--	--	--	--	
cis-1,3-Dichloropropene	ug/kg	--	--	--	--	--	--	--	--	--	
Cyclohexane	ug/kg	--	--	--	--	--	--	--	--	--	
Dibromochloromethane	ug/kg	--	--	--	--	--	--	--	--	--	
Dichlorodifluoromethane	ug/kg	--	--	--	--	--	--	--	--	--	
Ethylbenzene	ug/kg	--	--	--	--	--	--	--	--	--	
Hexachlorobutadiene	ug/kg	--	--	--	--	--	--	--	--	--	
Isopropylbenzene	ug/kg	--	--	--	--	--	--	--	--	--	
Methyl acetate	ug/kg	--	--	--	--	--	--	--	--	--	
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	--	--	--	--	--	--	
Methylcyclohexane	ug/kg	--	--	--	--	--	--	--	--	--	
Methylene chloride	ug/kg	--	--	--	--	--	--	--	--	--	
m,p-Xylenes	ug/kg	--	--	--	--	--	--	--	--	--	
o-Xylene	ug/kg	--	--	--	--	--	--	--	--	--	
Styrene	ug/kg	--	--	--	--	--	--	--	--	--	
Tetrachloroethene	ug/kg	--	--	14,000	--	--	--	--	--	--	
Tetrahydrofuran	ug/kg	--	--	--	--	--	--	--	--	--	
Toluene	ug/kg	--	--	--	--	--	--	--	--	--	
trans-1,2-Dichloroethene	ug/kg	--	--	--	--	--	--	--	--	--	
trans-1,3-Dichloropropene	ug/kg	--	--	--	--	--	--	--	--	--	
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	--	--	--	--	--	--	
Trichlorofluoromethane	ug/kg	--	--	--	--	--	--	--	--	--	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0026	B1WC0035	B1WC0036	B1WC0037	B1WC0038
						Sample Name:	B1WC0026S001	B1WC0035S001	B1WC0036S001	B1WC0037S001	B1WC0038S001
						Collection Date:	4/30/2010	6/17/2010	6/17/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Vinyl acetate	ug/kg	--	--	--	--	--	--	--	--	--	
Vinyl chloride	ug/kg	--	--	4,000	--	--	--	--	--	--	
Xylenes, Total	ug/kg	--	--	--	--	--	--	--	--	--	
SVOCs											
1,1'-Biphenyl	ug/kg	--	--	--	--	<331 {<99.4}	<333 {<99.9}	<332 {<99.6}	<332 {<99.6}	<332 {<99.7}	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
1-Naphthylamine	ug/kg	--	--	--	--	<331 {<99.4}	<333 {<99.9}	<332 {<99.6}	<332 {<99.6}	<332 {<99.7}	
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
2,4-Dichlorophenol	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
2,4-Dimethylphenol	ug/kg	--	--	--	--	<331 {<116}	<333 {<117}	<332 {<116}	<332 {<116}	<332 {<116}	
2,4-Dinitrophenol	ug/kg	--	--	--	--	<662 {<126}	<666 {<126}	<664 {<126}	<664 {<126}	<665 {<126}	
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<331 {<33.1}	<333 {<33.3}	<332 {<33.2}	<332 {<33.2}	<332 {<33.2}	
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<331 {<33.1}	<333 {<33.3}	<332 {<33.2}	<332 {<33.2}	<332 {<33.2}	
2-Chloronaphthalene	ug/kg	--	--	--	--	<33.1 {<10.9}	<33.3 {<11}	<33.2 {<11}	<33.2 {<11}	<33.2 {<11}	
2-Chlorophenol	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
2-Methylnaphthalene	ug/kg	--	--	--	--	<33.1 {<6.62}	<33.3 {<6.66}	<33.2 {<6.64}	<33.2 {<6.64}	<33.2 {<6.65}	
2-Methylphenol	ug/kg	--	--	200	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
2-Naphthylamine	ug/kg	--	--	--	--	<331 {<109}	<333 {<110}	<332 {<110}	<332 {<110}	<332 {<110}	
2-Nitroaniline	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
2-Nitrophenol	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
3,3-Dichlorobenzidine	ug/kg	--	--	--	--	<331 {<99.4}	<333 {<99.9}	<332 {<99.6}	<332 {<99.6}	<332 {<99.7}	
3-Nitroaniline	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
4-Aminobiphenyl	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
4-Chloroaniline	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
4-Chlorophenyl-phenylether	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
4-Methylphenol	ug/kg	--	--	200	--	<331 {<99.4}	<333 {<99.9}	<332 {<99.6}	<332 {<99.6}	<332 {<99.7}	
4-Nitroaniline	ug/kg	--	--	--	--	<331 {<99.4}	<333 {<99.9}	<332 {<99.6}	<332 {<99.6}	<332 {<99.7}	
4-Nitrophenol	ug/kg	--	--	--	--	<331 {<109}	<333 {<110}	<332 {<110}	<332 {<110}	<332 {<110}	
Acenaphthene	ug/kg	--	--	--	--	<33.1 {<10.9}	<33.3 {<11}	<33.2 {<11}	<33.2 {<11}	<33.2 {<11}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0026	B1WC0035	B1WC0036	B1WC0037	B1WC0038
						Sample Name:	B1WC0026S001	B1WC0035S001	B1WC0036S001	B1WC0037S001	B1WC0038S001
						Collection Date:	4/30/2010	6/17/2010	6/17/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Acenaphthylene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Acetophenone	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Anthracene	ug/kg	--	--	--	--	<33.1 {<6.62}	<33.3 {<6.66}	<33.2 {<6.64}	<33.2 {<6.64}	<33.2 {<6.65}	
Atrazine	ug/kg	--	--	--	--	<331 {<99.4}	<333 {<99.9}	<332 {<99.6}	<332 {<99.6}	<332 {<99.7}	
Benzaldehyde	ug/kg	--	--	--	--	<331 {<99.4}	<333 {<99.9}	<332 {<99.6}	<332 {<99.6}	<332 {<99.7}	
Benzidine	ug/kg	--	--	--	--	<331 {<99.4}	<333 {<99.9}	<332 {<99.6}	<332 {<99.6}	<332 {<99.7}	
Benzo(a)anthracene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Benzo(a)pyrene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	10.5 J	<33.2 {<9.97}	
Benzo(b)fluoranthene	ug/kg	--	--	--	--	<33.1 {<9.94}	21.8 J	<33.2 {<9.96}	21.8 J	<33.2 {<9.97}	
Benzo(ghi)perylene	ug/kg	--	--	--	--	<33.1 {<9.94}	21.2 J	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Butyl benzyl phthalate	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Caprolactam	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Carbazole	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Chrysene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	14.2 J	<33.2 {<9.97}	
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Dibenzofuran	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Diethyl phthalate	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	847	<332 {<66.5}	
Dimethyl phthalate	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Di-n-butyl phthalate	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Di-n-octyl phthalate	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Diphenylamine	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Fluoranthene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Fluorene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Hexachlorobenzene	ug/kg	--	--	2,600	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Hexachloroethane	ug/kg	--	--	60,000	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	<33.1 {<9.94}	20.2 J	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Isophorone	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Naphthalene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Nitrobenzene	ug/kg	--	--	40,000	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	B1WC0026	B1WC0035	B1WC0036	B1WC0037	B1WC0038
						Sample Name:	B1WC0026S001	B1WC0035S001	B1WC0036S001	B1WC0037S001	B1WC0038S001
						Collection Date:	4/30/2010	6/17/2010	6/17/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.5 - 1.0	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	
n-Nitrosodimethylamine	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<331 {<82.8}	<333 {<83.2}	<332 {<83}	<332 {<83}	<332 {<83.1}	
Phenanthrene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Phenol	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
Pyrene	ug/kg	--	--	--	--	<33.1 {<9.94}	<33.3 {<9.99}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.97}	
Pyridine	ug/kg	--	--	--	--	<331 {<66.2}	<333 {<66.6}	<332 {<66.4}	<332 {<66.4}	<332 {<66.5}	
RADIONUCLIDES	--	--	--	--	--	R	R	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-1 AND B1-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

H - Analytical holding time was exceeded.

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

SU - Standard Units

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2 STOCKPILE
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:			B1ST0001	B1ST0002	B1ST0003	B1ST0004
			Sample Name:			B1ST0001S001	B1ST0002S001	B1ST0003S001	B1ST0004S001
			Collection Date:			9/2/2010	9/2/2010	9/2/2010	9/2/2010
			Sample Depth (feet):			0 - 0.5	0 - 0.5	3.5 - 4	2 - 2.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
Metals									
Antimony	mg/kg	500	150	--	--	1.7 J	1.3 J	1.5 J	1.2 J
Arsenic	mg/kg	500	50	100	--	6.2	4.8	7.2	6.7
Barium	mg/kg	10,000	1,000	2,000	--	86	82	73	68
Beryllium	mg/kg	75	7.5	--	--	0.44 J	0.48 J	0.45 J	0.41 J
Cadmium	mg/kg	100	10	20	--	<0.2	<0.2	<0.2	<0.2
Chromium	mg/kg	500	50	100	--	21	18	21	18
Cobalt	mg/kg	8,000	800	--	--	5.4	4.7	5.2	4.8
Copper	mg/kg	2,500	250	--	--	12	11	12	11
Lead	mg/kg	1,000	50	100	--	8.1	5	8.2	11
Mercury	mg/kg	20	2	4	--	0.27	0.37	2	0.12
Mercury-STLC	mg/l	--	--	--	0.2	--	--	<0.0010	--
Molybdenum	mg/kg	3,500	3,500	--	--	0.67 J	0.68 J	0.66 J	0.58 J
Nickel	mg/kg	2,000	200	--	--	13	12	13	11
Selenium	mg/kg	100	10	20	--	<0.99	<0.99	<1	<0.99
Silver	mg/kg	500	50	100	--	<0.79	<0.79	<0.8	<0.79
Thallium	mg/kg	700	70	--	--	<0.79	<0.79	<0.8	<0.79
Vanadium	mg/kg	2,400	240	--	--	34	31	35	32
Zinc	mg/kg	5,000	2,500	--	--	65	47	81	150
TPH									
Gasoline Range Organics (C6-C12)	mg/kg	--	--	--	--	<0.37 {<0.14}	<0.37 {<0.14}	<0.39 {<0.14}	<0.38 {<0.14}
EFH (C10 - C24)	mg/kg	--	--	--	--	4.6 J	<5 {<3.5}	8.8	7.3
EFH (C10 - C40)	mg/kg	--	--	--	--	24	18	53	28
EFH (C25 - C40)	mg/kg	--	--	--	--	19	16	44	21
PCBs									
Aroclor 1016	ug/kg	50,000	50,000	--	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1221	ug/kg	50,000	50,000	--	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1232	ug/kg	50,000	50,000	--	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1242	ug/kg	50,000	50,000	--	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1248	ug/kg	50,000	50,000	--	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1254	ug/kg	50,000	50,000	--	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
Aroclor 1260	ug/kg	50,000	50,000	--	--	<50 {<12}	<50 {<12}	<50 {<12}	<50 {<12}
SVOCs									
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<670 {<100}	<500 {<75}	<670 {<100}	<670 {<100}
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
1,2-Diphenylhydrazine	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2 STOCKPILE
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

ANALYTE	UNITS	TTLIC	Object Name: Sample Name: Collection Date: Sample Depth (feet):			B1ST0001 B1ST0001S001 9/2/2010 0 - 0.5	B1ST0002 B1ST0002S001 9/2/2010 0 - 0.5	B1ST0003 B1ST0003S001 9/2/2010 3.5 - 4	B1ST0004 B1ST0004S001 9/2/2010 2 - 2.5
			WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<670 {<180}	<500 {<130}	<670 {<180}	<670 {<180}
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<670 {<130}	<500 {<97}	<670 {<130}	<670 {<130}
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<670 {<260}	<500 {<190}	<670 {<260}	<670 {<260}
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<670 {<150}	<500 {<110}	<670 {<150}	<670 {<150}
2,4-Dichlorophenol	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
2,4-Dimethylphenol	ug/kg	--	--	--	--	<670 {<200}	<500 {<150}	<670 {<200}	<670 {<200}
2,4-Dinitrophenol	ug/kg	--	--	--	--	<1300 {<220}	<990 {<160}	<1300 {<220}	<1300 {<220}
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<670 {<160}	<500 {<120}	<670 {<160}	<670 {<160}
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<670 {<190}	<500 {<140}	<670 {<190}	<670 {<190}
2-Chloronaphthalene	ug/kg	--	--	--	--	<670 {<130}	<500 {<97}	<670 {<130}	<670 {<130}
2-Chlorophenol	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}
2-Methylnaphthalene	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}
2-Methylphenol	ug/kg	--	--	200	--	<670 {<160}	<500 {<120}	<670 {<160}	<670 {<160}
2-Nitroaniline	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
2-Nitrophenol	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
3,3'-Dichlorobenzidine	ug/kg	--	--	--	--	<1700 {<300}	<1200 {<220}	<1700 {<300}	<1700 {<300}
3-Nitroaniline	ug/kg	--	--	--	--	<670 {<150}	<500 {<110}	<670 {<150}	<670 {<150}
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<830 {<220}	<620 {<160}	<830 {<220}	<830 {<220}
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<670 {<150}	<500 {<110}	<670 {<150}	<670 {<150}
4-Chloro-3-Methylphenol	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}
4-Chlorophenyl phenyl ether	ug/kg	--	--	--	--	<670 {<170}	<500 {<130}	<670 {<170}	<670 {<170}
4-Methylphenol	ug/kg	--	--	200	--	<670 {<160}	<500 {<120}	<670 {<160}	<670 {<160}
4-Nitrophenol	ug/kg	--	--	--	--	<1700 {<280}	<1200 {<210}	<1700 {<280}	<1700 {<280}
Acenaphthene	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
Acenaphthylene	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}
Aniline	ug/kg	--	--	--	--	<830 {<170}	<620 {<130}	<830 {<170}	<830 {<170}
Anthracene	ug/kg	--	--	--	--	<670 {<160}	<500 {<120}	<670 {<160}	<670 {<160}
Benzidine	ug/kg	--	--	--	--	<1300 {<1300}	<990 {<990}	<1300 {<1300}	<1300 {<1300}
Benzo(a)anthracene	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	180 J
Benzo(a)pyrene	ug/kg	--	--	--	--	<670 {<110}	<500 {<82}	<670 {<110}	160 J
Benzo(b)fluoranthene	ug/kg	--	--	--	--	<670 {<100}	<500 {<75}	<670 {<100}	240 J
Benzo(ghi)perylene	ug/kg	--	--	--	--	<670 {<220}	<500 {<160}	<670 {<220}	<670 {<220}
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}
Benzoic acid	ug/kg	--	--	--	--	<1700 {<300}	<1200 {<220}	<1700 {<300}	<1700 {<300}
Benzyl alcohol	ug/kg	--	--	--	--	<670 {<400}	<500 {<300}	<670 {<400}	<670 {<400}
bis(2-Chloroethoxy)methane	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2 STOCKPILE
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

ANALYTE	UNITS	TTLIC	Object Name: Sample Name: Collection Date: Sample Depth (feet):			B1ST0001 B1ST0001S001 9/2/2010 0 - 0.5	B1ST0002 B1ST0002S001 9/2/2010 0 - 0.5	B1ST0003 B1ST0003S001 9/2/2010 3.5 - 4	B1ST0004 B1ST0004S001 9/2/2010 2 - 2.5
			WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
bis(2-Chloroisopropyl)ether	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<670 {<180}	<500 {<130}	<670 {<180}	<670 {<180}
Butyl benzyl phthalate	ug/kg	--	--	--	--	<670 {<160}	<500 {<120}	<670 {<160}	<670 {<160}
Chrysene	ug/kg	--	--	--	--	<670 {<150}	<500 {<110}	<670 {<150}	200 J
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<830 {<200}	<620 {<150}	<830 {<200}	<830 {<200}
Dibenzofuran	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
Diethyl phthalate	ug/kg	--	--	--	--	<670 {<190}	<500 {<140}	<670 {<190}	<670 {<190}
Dimethyl phthalate	ug/kg	--	--	--	--	<670 {<130}	<500 {<97}	<670 {<130}	<670 {<130}
Di-n-butyl phthalate	ug/kg	--	--	--	--	<670 {<180}	<500 {<130}	<670 {<180}	<670 {<180}
Di-n-octyl phthalate	ug/kg	--	--	--	--	<670 {<180}	<500 {<130}	<670 {<180}	<670 {<180}
Fluoranthene	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	240 J
Fluorene	ug/kg	--	--	--	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}
Hexachlorobenzene	ug/kg	--	--	2,600	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<1700 {<180}	<1200 {<130}	<1700 {<180}	<1700 {<180}
Hexachloroethane	ug/kg	--	--	60,000	--	<670 {<130}	<500 {<97}	<670 {<130}	<670 {<130}
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	<670 {<260}	<500 {<190}	<670 {<260}	<670 {<260}
Isophorone	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
Naphthalene	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
Nitrobenzene	ug/kg	--	--	40,000	--	<670 {<140}	<500 {<100}	<670 {<140}	<670 {<140}
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<500 {<140}	<370 {<100}	<500 {<140}	<500 {<140}
N-Nitrosodiphenylamine	ug/kg	--	--	--	--	<670 {<160}	<500 {<120}	<670 {<160}	<670 {<160}
p-Chloroaniline	ug/kg	--	--	--	--	<670 {<240}	<500 {<180}	<670 {<240}	<670 {<240}
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<1700 {<300}	<1200 {<220}	<1700 {<300}	<1700 {<300}
Phenanthrene	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
Phenol	ug/kg	--	--	--	--	<670 {<180}	<500 {<130}	<670 {<180}	<670 {<180}
p-Nitroaniline	ug/kg	--	--	--	--	<1700 {<180}	<1200 {<130}	<1700 {<180}	<1700 {<180}
Pyrene	ug/kg	--	--	--	--	<670 {<160}	<500 {<120}	<670 {<160}	250 J
Pyridine	ug/kg	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	ug/kg	--	--	--	--	<2 {<0.57}	<1.9 {<0.55}	<2 {<0.57}	<2 {<0.57}
1,1,1-Trichloroethane	ug/kg	--	--	--	--	<1 {<0.7}	<0.97 {<0.68}	<1 {<0.7}	<0.99 {<0.69}
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	--	<2 {<0.86}	<1.9 {<0.83}	<2 {<0.86}	<2 {<0.85}
1,1,2-Trichloroethane	ug/kg	--	--	--	--	<1 {<0.87}	<0.97 {<0.84}	<1 {<0.87}	<0.99 {<0.86}
1,1-Dichloroethane	ug/kg	--	--	--	--	<1 {<0.5}	<0.97 {<0.48}	<1 {<0.5}	<0.99 {<0.5}
1,1-Dichloroethene	ug/kg	--	--	14,000	--	<2 {<0.6}	<1.9 {<0.58}	<2 {<0.6}	<2 {<0.6}
1,1-Dichloropropene	ug/kg	--	--	--	--	<1 {<0.4}	<0.97 {<0.39}	<1 {<0.4}	<0.99 {<0.4}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2 STOCKPILE
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

ANALYTE	UNITS	TTLIC	Object Name: Sample Name: Collection Date: Sample Depth (feet):			B1ST0001 B1ST0001S001 9/2/2010 0 - 0.5	B1ST0002 B1ST0002S001 9/2/2010 0 - 0.5	B1ST0003 B1ST0003S001 9/2/2010 3.5 - 4	B1ST0004 B1ST0004S001 9/2/2010 2 - 2.5
			WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
1,2,3-Trichlorobenzene	ug/kg	--	--	--	--	<2 {<1}	<1.9 {<0.97}	<2 {<1}	<2 {<0.99}
1,2,3-Trichloropropane	ug/kg	--	--	--	--	<2 {<1}	<1.9 {<0.97}	<2 {<1}	<2 {<0.99}
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<670 {<100}	<500 {<75}	<670 {<100}	<670 {<100}
1,2,4-Trimethylbenzene	ug/kg	--	--	--	--	<1 {<0.78}	<0.97 {<0.75}	<1 {<0.78}	<0.99 {<0.77}
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	--	<10 {<1.5}	<9.7 {<1.5}	<10 {<1.5}	<9.9 {<1.5}
1,2-Dibromoethane	ug/kg	--	--	--	--	<1 {<0.8}	<0.97 {<0.77}	<1 {<0.8}	<0.99 {<0.79}
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
1,2-Dichloroethane	ug/kg	--	--	10,000	--	<1 {<0.8}	<0.97 {<0.77}	<1 {<0.8}	<0.99 {<0.79}
1,2-Dichloropropane	ug/kg	--	--	--	--	<1 {<0.8}	<0.97 {<0.77}	<1 {<0.8}	<0.99 {<0.79}
1,3,5-Trimethylbenzene	ug/kg	--	--	--	--	<1 {<0.63}	<0.97 {<0.61}	<1 {<0.63}	<0.99 {<0.62}
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<670 {<180}	<500 {<130}	<670 {<180}	<670 {<180}
1,3-Dichloropropane	ug/kg	--	--	--	--	<1 {<0.63}	<0.97 {<0.61}	<1 {<0.63}	<0.99 {<0.62}
1,4-Dichlorobenzene	ug/kg	--	--	--	--	<670 {<130}	<500 {<97}	<670 {<130}	<670 {<130}
2,2-Dichloropropane	ug/kg	--	--	--	--	<1 {<0.6}	<0.97 {<0.58}	<1 {<0.6}	<0.99 {<0.6}
2-Butanone (MEK)	ug/kg	--	--	4,000,000	--	<10 {<6}	<9.7 {<5.8}	24	<9.9 {<6}
2-Chloroethylvinyl ether	ug/kg	--	--	--	--	<330 {<120}	<250 {<90}	<330 {<120}	<330 {<120}
2-Chlorotoluene	ug/kg	--	--	--	--	<2 {<0.87}	<1.9 {<0.84}	<2 {<0.87}	<2 {<0.86}
2-Hexanone	ug/kg	--	--	--	--	<10 {<9.1}	<9.7 {<8.8}	<10 {<9.1}	<9.9 {<9}
4-Chlorotoluene	ug/kg	--	--	--	--	<2 {<0.74}	<1.9 {<0.72}	<2 {<0.74}	<2 {<0.73}
4-Methyl-2-pentanone	ug/kg	--	--	--	--	<5 {<4.5}	<4.8 {<4.4}	<5 {<4.5}	<5 {<4.5}
Acetone	ug/kg	--	--	--	--	<10 {<8}	<9.7 {<7.7}	210	180
Benzene	ug/kg	--	--	10,000	--	<1 {<0.5}	<0.97 {<0.48}	<1 {<0.5}	<0.99 {<0.5}
Bromobenzene	ug/kg	--	--	--	--	<2 {<0.84}	<1.9 {<0.81}	<2 {<0.84}	<2 {<0.83}
Bromochloromethane	ug/kg	--	--	--	--	<2 {<0.9}	<1.9 {<0.87}	<2 {<0.9}	<2 {<0.89}
Bromodichloromethane	ug/kg	--	--	--	--	<1 {<0.5}	<0.97 {<0.48}	<1 {<0.5}	<0.99 {<0.5}
Bromoform	ug/kg	--	--	--	--	<2 {<0.8}	<1.9 {<0.77}	<2 {<0.8}	<2 {<0.79}
Bromomethane	ug/kg	--	--	--	--	<2 {<0.92}	<1.9 {<0.89}	<2 {<0.92}	<2 {<0.91}
Carbon disulfide	ug/kg	--	--	--	--	<5 {<0.97}	<4.8 {<0.94}	<5 {<0.97}	<5 {<0.96}
Carbon tetrachloride	ug/kg	--	--	10,000	--	<2 {<0.5}	<1.9 {<0.48}	<2 {<0.5}	<2 {<0.5}
Chlorobenzene	ug/kg	--	--	2,000,000	--	<1 {<0.52}	<0.97 {<0.5}	<1 {<0.52}	<0.99 {<0.52}
Chloroethane	ug/kg	--	--	--	--	<2 {<1.5}	<1.9 {<1.5}	<2 {<1.5}	<2 {<1.5}
Chloroform	ug/kg	--	--	120,000	--	<1 {<0.5}	<0.97 {<0.48}	<1 {<0.5}	<0.99 {<0.5}
Chloromethane	ug/kg	--	--	--	--	<2 {<1}	<1.9 {<0.97}	<2 {<1}	<2 {<0.99}
cis-1,2-Dichloroethene	ug/kg	--	--	--	--	<1 {<0.83}	<0.97 {<0.8}	<1 {<0.83}	<0.99 {<0.82}
cis-1,3-Dichloropropene	ug/kg	--	--	--	--	<1 {<0.44}	<0.97 {<0.43}	<1 {<0.44}	<0.99 {<0.44}
Dibromochloromethane	ug/kg	--	--	--	--	<1 {<0.7}	<0.97 {<0.68}	<1 {<0.7}	<0.99 {<0.69}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2 STOCKPILE
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name: Sample Name: Collection Date: Sample Depth (feet):			B1ST0001 B1ST0001S001 9/2/2010 0 - 0.5	B1ST0002 B1ST0002S001 9/2/2010 0 - 0.5	B1ST0003 B1ST0003S001 9/2/2010 3.5 - 4	B1ST0004 B1ST0004S001 9/2/2010 2 - 2.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c
Dibromomethane	ug/kg	--	--	--	--	<1 {<0.9}	<0.97 {<0.87}	<1 {<0.9}	<0.99 {<0.89}
Dichlorodifluoromethane	ug/kg	--	--	--	--	<5 {<1.5}	<4.8 {<1.5}	<5 {<1.5}	<5 {<1.5}
Ethylbenzene	ug/kg	--	--	--	--	<1 {<0.5}	<0.97 {<0.48}	<1 {<0.5}	<0.99 {<0.5}
Hexachlorobutadiene	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
Isopropylbenzene	ug/kg	--	--	--	--	<1 {<0.54}	<0.97 {<0.52}	<1 {<0.54}	<0.99 {<0.54}
m,p-Xylenes	ug/kg	--	--	--	--	<2 {<0.8}	<1.9 {<0.77}	<2 {<0.8}	<2 {<0.79}
Methyl tert-butyl ether	ug/kg	--	--	--	--	<2 {<1}	<1.9 {<0.97}	<2 {<1}	<2 {<0.99}
Methylene chloride	ug/kg	--	--	--	--	<10 {<6.5}	<9.7 {<6.3}	<10 {<6.5}	<9.9 {<6.4}
Naphthalene	ug/kg	--	--	--	--	<670 {<120}	<500 {<90}	<670 {<120}	<670 {<120}
n-Butylbenzene	ug/kg	--	--	--	--	<2 {<0.72}	<1.9 {<0.7}	<2 {<0.72}	<2 {<0.71}
n-Propylbenzene	ug/kg	--	--	--	--	<1 {<0.61}	<0.97 {<0.59}	<1 {<0.61}	<0.99 {<0.61}
o-Xylene	ug/kg	--	--	--	--	<1 {<0.5}	<0.97 {<0.48}	<1 {<0.5}	<0.99 {<0.5}
p-Isopropyltoluene	ug/kg	--	--	--	--	<1 {<0.72}	<0.97 {<0.7}	0.86 J	<0.99 {<0.71}
sec-Butylbenzene	ug/kg	--	--	--	--	<2 {<0.67}	<1.9 {<0.65}	<2 {<0.67}	<2 {<0.66}
Styrene	ug/kg	--	--	--	--	<1 {<0.58}	<0.97 {<0.56}	<1 {<0.58}	<0.99 {<0.58}
tert-Butylbenzene	ug/kg	--	--	--	--	<2 {<0.62}	<1.9 {<0.6}	<2 {<0.62}	<2 {<0.62}
Tetrachloroethene	ug/kg	--	--	14,000	--	<1 {<0.49}	<0.97 {<0.47}	<1 {<0.49}	<0.99 {<0.49}
Toluene	ug/kg	--	--	--	--	<1 {<0.5}	<0.97 {<0.48}	<1 {<0.5}	<0.99 {<0.5}
trans-1,2-Dichloroethene	ug/kg	--	--	--	--	<1 {<0.7}	<0.97 {<0.68}	<1 {<0.7}	<0.99 {<0.69}
trans-1,3-Dichloropropene	ug/kg	--	--	--	--	<1 {<0.61}	<0.97 {<0.59}	<1 {<0.61}	<0.99 {<0.61}
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	--	<1 {<0.5}	<0.97 {<0.48}	<1 {<0.5}	<0.99 {<0.5}
Trichlorofluoromethane	ug/kg	--	--	--	--	<2 {<0.54}	<1.9 {<0.52}	<2 {<0.54}	<2 {<0.54}
Vinyl acetate	ug/kg	--	--	--	--	<5 {<2.5}	<4.8 {<2.4}	<5 {<2.5}	<5 {<2.5}
Vinyl chloride	ug/kg	--	--	4,000	--	<2 {<0.91}	<1.9 {<0.88}	<2 {<0.91}	<2 {<0.9}
RADIONUCLIDES	--	--	--	--	--	R	R	R	R

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – B1-2 STOCKPILE
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

**ISRA 009 – B1-2.
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of the 12 samples taken at the ISRA Outfall 009, B1-2 area. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹.

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 ~0.037 pCi/g and ~0.038 pCi/g respectively. Minimum detectable activity for tritium averaged ~0.74 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.

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.

Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from B1-2 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 0.158 pCi/g which is less than the highest background result of 0.21 pCi/g. The highest non-background subtracted Cs-137 result is equivalent to an effective dose of 0.11 mrem/y⁶.

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/>.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from B1-2 does not exceed the local background for Sr-90, and indeed is all non-detect. The incremental dose from Sr-90 above background is therefore zero mrem/y. The highest Sr-90 result is 0.037 pCi/g which is non-detect and less than the highest background result of 0.13 pCi/g. The highest non-background subtracted, non-detect Sr-90 result is equivalent to an effective dose of 0.011 mrem/y⁶.

Tritium - All tritium results are non-detect, the average tritium result is -0.2 pCi/g and the highest tritium result is 0.052 pCi/g. The highest non-detected, non-background subtracted tritium result is equivalent to an effective dose of 0.0007 mrem/y⁶.

This waste is certified to be “radiologically” acceptable for shipment to, and disposal at, any waste disposal facility. The waste requires no further radiological controls.

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 B1-2 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 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.

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 8 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>

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*



Phil Rutherford
Manager, Health, Safety & Radiation Services

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)	0.008
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:	12
Z-value for Alpha	1.645
Critical Value	1726
Sum of Reference Ranks	1728

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	0.062
Max	0.213	0.158
Min	0.015	-0.023
σ	0.062	0.061
$m-1.96\sigma$	-0.035	-0.058
$m+1.96\sigma$	0.210	0.181

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1		0.092	0.100	R	36	36
2		0.020	0.028	R	12	12
3		0.020	0.028	R	12	12
4		0.100	0.108	R	42	42
5		0.020	0.028	R	12	12
6		0.158	0.166	R	55.5	55.5
7		0.175	0.183	R	57	57
8		0.209	0.217	R	62	62
9		0.180	0.188	R	58	58
10		0.030	0.038	R	20	20
11		0.213	0.221	R	63	63
12		0.025	0.033	R	17	17
13		0.020	0.028	R	12	12
14		0.020	0.028	R	12	12
15		0.074	0.082	R	31	31
16		0.147	0.155	R	50	50
17		0.100	0.108	R	42	42

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
18		0.067	0.075	R	28.5	28.5
19		0.099	0.107	R	39	39
20		0.101	0.109	R	43	43
21		0.148	0.156	R	51	51
22		0.153	0.161	R	54	54
23		0.025	0.033	R	17	17
24		0.188	0.196	R	59	59
25		0.198	0.206	R	61	61
26		0.030	0.038	R	20	20
27		0.079	0.087	R	32	32
28		0.158	0.166	R	55.5	55.5
29		0.109	0.117	R	45	45
30		0.059	0.067	R	27	27
31		0.067	0.075	R	28.5	28.5
32		0.113	0.121	R	46	46
33		0.015	0.023	R	7	7
34		0.031	0.039	R	22	22
35		0.042	0.050	R	25	25
36		0.097	0.105	R	37.5	37.5
37		0.015	0.023	R	7	7
38		0.020	0.028	R	12	12
39		0.085	0.093	R	34	34
40		0.080	0.088	R	33	33
41		0.015	0.023	R	7	7
42		0.020	0.028	R	12	12
43		0.035	0.043	R	23.5	23.5
44		0.035	0.043	R	23.5	23.5
45		0.025	0.033	R	17	17
46		0.150	0.158	R	52.5	52.5
47		0.140	0.148	R	48.5	48.5
48		0.190	0.198	R	60	60
49		0.097	0.105	R	37.5	37.5
50		0.030	0.038	R	20	20
51		0.140	0.148	R	48.5	48.5
52	B1WC0019S001	-0.001	-0.001	S	3	0
53	B1WC0020S001	0.018	0.018	S	5	0
54	B1WC0021S001	0.054	0.054	S	26	0
55	B1WC0022S001	0.108	0.108	S	41	0
56	B1WC0023S001	0.158	0.158	S	52.5	0
57	B1WC0024S001	0.133	0.133	S	47	0
58	B1WC0025S001	0.098	0.098	S	35	0
59	B1WC0026S001	0.113	0.113	S	44	0
60	B1WC0035S001	0.078	0.078	S	30	0
61	B1WC0036S001	-0.023	-0.023	S	1	0
62	B1WC0037S001	-0.002	-0.002	S	2	0
63	B1WC0038S001	0.006	0.006	S	4	0
Sum					2018	1727.5

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, Ho, is: Survey sample concentrations exceed those in the background

The alternative hypothesis, Ha, 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)	0.00
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:	12
Z-value for Alpha	1.645
Critical Value	1726
Sum of Reference Ranks	1895

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	0.012
Max	0.130	0.037
Min	0.005	-0.002
σ	0.030	0.012
$m-1.96*\sigma$	-0.008	-0.013
$m+1.96*\sigma$	0.109	0.036

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1		0.030	0.030	R	23	23
2		0.010	0.010	R	9.5	9.5
3		0.045	0.045	R	38.5	38.5
4		0.045	0.045	R	38.5	38.5
5		0.050	0.050	R	48	48
6		0.040	0.040	R	30	30
7		0.035	0.035	R	25.5	25.5
8		0.050	0.050	R	48	48
9		0.050	0.050	R	48	48
10		0.130	0.130	R	62.5	62.5
11		0.120	0.120	R	61	61
12		0.040	0.040	R	30	30
13		0.045	0.045	R	38.5	38.5
14		0.130	0.130	R	62.5	62.5
15		0.050	0.050	R	48	48
16		0.088	0.088	R	56	56
17		0.080	0.080	R	53	53
18		0.100	0.100	R	60	60
19		0.069	0.069	R	52	52
20		0.097	0.097	R	58	58

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
21		0.084	0.084	R	55	55
22		0.098	0.098	R	59	59
23		0.045	0.045	R	38.5	38.5
24		0.045	0.045	R	38.5	38.5
25		0.020	0.020	R	15	15
26		0.045	0.045	R	38.5	38.5
27		0.089	0.089	R	57	57
28		0.050	0.050	R	48	48
29		0.045	0.045	R	38.5	38.5
30		0.050	0.050	R	48	48
31		0.045	0.045	R	38.5	38.5
32		0.040	0.040	R	30	30
33		0.045	0.045	R	38.5	38.5
34		0.045	0.045	R	38.5	38.5
35		0.045	0.045	R	38.5	38.5
36		0.025	0.025	R	19.5	19.5
37		0.082	0.082	R	54	54
38		0.045	0.045	R	38.5	38.5
39		0.040	0.040	R	30	30
40		0.035	0.035	R	25.5	25.5
41		0.025	0.025	R	19.5	19.5
42		0.005	0.005	R	4	4
43		0.020	0.020	R	15	15
44		0.010	0.010	R	9.5	9.5
45		0.020	0.020	R	15	15
46		0.020	0.020	R	15	15
47		0.050	0.050	R	48	48
48		0.030	0.030	R	23	23
49		0.030	0.030	R	23	23
50		0.020	0.020	R	15	15
51		0.040	0.040	R	30	30
52	B1WC0019S001	-0.001	-0.001	S	2	0
53	B1WC0020S001	0.007	0.007	S	7	0
54	B1WC0021S001	0.016	0.016	S	12	0
55	B1WC0022S001	0.037	0.037	S	27	0
56	B1WC0023S001	0.029	0.029	S	21	0
57	B1WC0024S001	0.000	0.000	S	3	0
58	B1WC0025S001	0.024	0.024	S	18	0
59	B1WC0026S001	0.008	0.008	S	8	0
60	B1WC0035S001	0.006	0.006	S	6	0
61	B1WC0036S001	0.010	0.010	S	11	0
62	B1WC0037S001	0.006	0.006	S	5	0
63	B1WC0038S001	-0.002	-0.002	S	1	0
Sum					2016	1895

Soil Data from ISRA 009 - B1-2

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	B1WC0019S001	N/A	4/30/2010	252090	-0.00076	0.0228	0.0407	NDA	-0.000999	0.0189	0.0382	NDA	-0.18	0.455	0.797	NDA
2	B1WC0020S001	N/A	4/30/2010	252090	0.0182	0.0208	0.0382	NDA	0.0073	0.0185	0.0343	NDA	-0.44	0.44	0.787	NDA
3	B1WC0021S001	N/A	4/30/2010	252090	0.0535	0.0323	0.0314		0.016	0.0211	0.0361	NDA	-0.199	0.454	0.797	NDA
4	B1WC0022S001	N/A	4/30/2010	252090	0.108	0.0356	0.0442		0.0368	0.025	0.0379	NDA	-0.379	0.448	0.796	NDA
5	B1WC0023S001	N/A	4/30/2010	252090	0.158	0.0443	0.0284		0.0294	0.021	0.0324	NDA	-0.238	0.428	0.756	NDA
6	B1WC0024S001	N/A	4/30/2010	252090	0.133	0.0345	0.0287		8.62E-06	0.0224	0.0425	NDA	-0.49	0.441	0.792	NDA
7	B1WC0025S001	N/A	4/30/2010	252090	0.0983	0.0313	0.0377		0.024	0.0241	0.0393	NDA	-0.00941	0.457	0.791	NDA
8	B1WC0026S001	N/A	4/30/2010	252090	0.113	0.0354	0.0373		0.00828	0.0229	0.0416	NDA	-0.426	0.446	0.797	NDA
9	B1WC0035S001	N/A	6/17/2010	255147	0.0781	0.032	0.0357		0.00645	0.023	0.0407	NDA	0.036	0.366	0.663	NDA
10	B1WC0036S001	N/A	6/17/2010	255147	-0.0232	0.0215	0.0361	NDA	0.0102	0.0225	0.0393	NDA	0.0348	0.354	0.641	NDA
11	B1WC0037S001	N/A	6/17/2010	255147	-0.0023	0.0229	0.0404	NDA	0.00632	0.0237	0.0422	NDA	0.0517	0.352	0.635	NDA
12	B1WC0038S001	N/A	6/17/2010	255147	0.00584	0.0221	0.0399	NDA	-0.00221	0.0204	0.0373	NDA	-0.0172	0.346	0.635	NDA

	Cesium-137 (pCi/g)				Strontium-90 (pCi/g)				Tritium (pCi/g)			
	Activity	MDA	Non-detect?	Count	Activity	MDA	Non-detect?	Count	Activity	MDA	Non-detect?	Count
Average	0.062	0.037		12	0.012	0.038		12	-0.188	0.741		12
Maximum	0.158	0.044		12	0.037	0.043		12	0.052	0.797		12
Minimum	-0.023	0.028		12	-0.002	0.032		12	-0.490	0.635		12
Number of Non-Detects				5				12				12
% Non-Detects				42%				100%				100%

Appendix 2
Radionuclide Results

ISRA Outfall 009 - B1-2

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
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Americium-241	-0.0704	0.153	0.286	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Americium-241	0.0531	0.127	0.218	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Americium-241	0.00787	0.0703	0.116	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Americium-241	0.0308	0.033	0.0598	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Americium-241	0.00214	0.0729	0.123	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Americium-241	0.0366	0.0564	0.0973	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Americium-241	-0.118	0.0943	0.173	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Americium-241	-0.0954	0.0945	0.153	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Americium-241	0.0302	0.064	0.109	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Americium-241	0.145	0.103	0.178	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Americium-241	0.0424	0.103	0.174	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Americium-241	0.102	0.112	0.221	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Cesium-134	0.0524	0.0287	0.0547	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Cesium-134	0	0.0331	0.0482	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Cesium-134	0	0.0373	0.0466	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Cesium-134	0.0559	0.0446	0.0607	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Cesium-134	0.0327	0.0322	0.0438	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Cesium-134	0.0406	0.0301	0.0417	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Cesium-134	0	0.0408	0.0537	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Cesium-134	0	0.0397	0.0519	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Cesium-134	0	0.0359	0.0473	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Cesium-134	0	0.0486	0.0579	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Cesium-134	0	0.0442	0.0597	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Cesium-134	0	0.0407	0.05	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Cesium-137	-0.00076	0.0228	0.0407	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Cesium-137	0.0182	0.0208	0.0382	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Cesium-137	0.0535	0.0323	0.0314	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Cesium-137	0.108	0.0356	0.0442	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Cesium-137	0.158	0.0443	0.0284	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Cesium-137	0.133	0.0345	0.0287	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Cesium-137	0.0983	0.0313	0.0377	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Cesium-137	0.113	0.0354	0.0373	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Cesium-137	0.0781	0.032	0.0357	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste	
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Cesium-137	-0.0232	0.0215	0.0361	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Cesium-137	-0.0023	0.0229	0.0404	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Cesium-137	0.00584	0.0221	0.0399	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Cobalt-60	0.00831	0.0251	0.0432	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Cobalt-60	0.024	0.0205	0.0385	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Cobalt-60	0.0138	0.0208	0.0373	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Cobalt-60	0.0127	0.0235	0.043	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Cobalt-60	-0.00342	0.0189	0.0317	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Cobalt-60	0.0076	0.0155	0.0272	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Cobalt-60	-0.00652	0.0213	0.0362	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Cobalt-60	0.00669	0.0221	0.0393	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Cobalt-60	-0.00603	0.0192	0.0311	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Cobalt-60	0.0121	0.0213	0.0383	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Cobalt-60	-0.00464	0.0224	0.038	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Cobalt-60	-0.00373	0.0212	0.036	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Europium-152	0.0215	0.0908	0.114	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Europium-152	0.0158	0.0529	0.0841	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Europium-152	-0.042	0.0645	0.0841	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Europium-152	-0.0529	0.0544	0.0908	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Europium-152	-0.00544	0.0564	0.083	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Europium-152	-0.0441	0.0479	0.0705	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Europium-152	0.0289	0.0677	0.102	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Europium-152	0.0339	0.0586	0.0953	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Europium-152	-0.036	0.0495	0.0825	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Europium-152	-0.0223	0.0644	0.103	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Europium-152	0.0231	0.0605	0.101	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Europium-152	0.0218	0.0552	0.0942	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Europium-154	0.0155	0.0712	0.122	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Europium-154	-0.00849	0.0648	0.111	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Europium-154	-0.00364	0.0654	0.112	NDA	pCi					

ISRA Outfall 009 - B1-2

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
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Europium-154	0.0615	0.0764	0.137	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Europium-154	0.00383	0.0608	0.105	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Europium-154	-0.0267	0.0554	0.0889	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Europium-154	0.0351	0.0717	0.128	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Europium-154	0.00512	0.0662	0.112	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Europium-154	0.0511	0.0612	0.109	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Europium-154	-0.0914	0.0704	0.111	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Europium-154	0.0566	0.073	0.133	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Europium-154	-0.023	0.0649	0.11	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Manganese-54	0.0207	0.0219	0.0402	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Manganese-54	-0.00814	0.0204	0.0343	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Manganese-54	0.0251	0.021	0.0377	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Manganese-54	-0.00808	0.024	0.0414	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Manganese-54	-0.00174	0.0184	0.0311	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Manganese-54	-0.00192	0.0156	0.0271	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Manganese-54	0.011	0.0206	0.0369	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Manganese-54	0.0286	0.0222	0.0373	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Manganese-54	-0.00245	0.0186	0.0322	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Manganese-54	0.035	0.0219	0.0383	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Manganese-54	0.00285	0.0213	0.0372	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Manganese-54	0.0189	0.0199	0.0364	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Potassium-40	19.3	2.09	0.281	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Potassium-40	20.2	2.13	0.317	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Potassium-40	21.4	2.05	0.261	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Potassium-40	21.2	2.14	0.36	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Potassium-40	14.5	1.49	0.27	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Potassium-40	17.7	1.71	0.237	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Potassium-40	21.9	2.5	0.294	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Potassium-40	20.2	2	0.261	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Potassium-40	22.6	2.14	0.269	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste	
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Potassium-40	24.2	2.76	0.323	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste	
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Potassium-40	22	2.19	0.313	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste	
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Potassium-40	22.7	2.3	0.311	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Sodium-22	0.00698	0.0249	0.0429	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Sodium-22	-0.00313	0.0227	0.0389	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Sodium-22	-0.000595	0.023	0.0393	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Sodium-22	0.0118	0.0276	0.048	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Sodium-22	0.00293	0.0212	0.0367	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Sodium-22	-0.00848	0.0194	0.0312	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Sodium-22	0.0118	0.0251	0.0449	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Sodium-22	0.00332	0.0232	0.0396	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Sodium-22	0.0151	0.0216	0.0381	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Sodium-22	-0.0318	0.0246	0.039	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Sodium-22	0.0264	0.0251	0.0468	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Sodium-22	-0.00392	0.0224	0.0384	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Strontium-90	-0.000999	0.0189	0.0382	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Strontium-90	0.0073	0.0185	0.0343	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Strontium-90	0.016	0.0211	0.0361	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Strontium-90	0.0368	0.025	0.0379	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Strontium-90	0.0294	0.021	0.0324	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Strontium-90	8.62E-06	0.0224	0.0425	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Strontium-90	0.024	0.0241	0.0393	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Strontium-90	0.00828	0.0229	0.0416	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Strontium-90	0.00645	0.023	0.0407	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Strontium-90	0.0102	0.0225	0.0393	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Strontium-90	0.00632	0.0237	0.0422	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Strontium-90	-0.00221	0.0204	0.0373	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Thorium-228	1.27	0.167	0.0647	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Thorium-228	1.17	0.143	0.0717	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Thorium-228	1.16	0.124	0.0507	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Thorium-228	1.08	0.132	0.0599	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Thorium-228	0.784	0.0908	0.0455	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Thorium-228	1.02	0.118	0.0425	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste	

ISRA Outfall 009 - B1-2

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
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Thorium-228	1.29	0.141	0.0556		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Thorium-228	0.948	0.116	0.0783		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Thorium-228	1.35	0.154	0.0501		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Thorium-228	1.4	0.151	0.0635		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Thorium-228	1.35	0.152	0.0598		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Thorium-228	1.21	0.144	0.0525		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Thorium-232	1.24	0.229	0.138		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Thorium-232	1.38	0.244	0.131		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Thorium-232	1.2	0.214	0.135		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Thorium-232	1.3	0.254	0.153		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Thorium-232	0.815	0.194	0.117		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Thorium-232	0.936	0.185	0.106		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Thorium-232	1.39	0.274	0.123		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Thorium-232	1.29	0.216	0.121		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Thorium-232	1.47	0.235	0.116		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Thorium-232	1.44	0.288	0.14		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Thorium-232	1.37	0.259	0.151		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Thorium-232	1.22	0.228	0.135		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Tritium	-0.18	0.455	0.797	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Tritium	-0.44	0.44	0.787	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Tritium	-0.199	0.454	0.797	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Tritium	-0.379	0.448	0.796	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Tritium	-0.238	0.428	0.756	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Tritium	-0.49	0.441	0.792	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Tritium	-0.00941	0.457	0.791	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Tritium	-0.426	0.446	0.797	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Tritium	0.036	0.366	0.663	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Tritium	0.0348	0.354	0.641	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Tritium	0.0517	0.352	0.635	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Tritium	-0.0172	0.346	0.635	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Uranium-235	-0.016	0.143	0.244	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Uranium-235	-0.00723	0.11	0.188	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Uranium-235	0.0313	0.107	0.188	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Uranium-235	0.0276	0.11	0.194	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Uranium-235	0.035	0.0992	0.17	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Uranium-235	-0.00359	0.0963	0.166	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Uranium-235	0.0131	0.129	0.225	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Uranium-235	0.0806	0.112	0.205	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Uranium-235	0.0639	0.11	0.191	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Uranium-235	0.0795	0.136	0.238	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Uranium-235	-0.0818	0.124	0.22	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Uranium-235	0.096	0.109	0.2	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0019	B1WC0019S001	Soil	Uranium-238	0.424	1.27	2.31	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0020	B1WC0020S001	Soil	Uranium-238	2.23	1.4	1.71		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0021	B1WC0021S001	Soil	Uranium-238	1.02	0.772	1.04	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0022	B1WC0022S001	Soil	Uranium-238	1.04	0.505	0.592		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0023	B1WC0023S001	Soil	Uranium-238	1.02	1.03	1.05	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0024	B1WC0024S001	Soil	Uranium-238	0.788	0.686	0.843	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0025	B1WC0025S001	Soil	Uranium-238	1.24	0.885	1.62	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	B1-2	B1WC0026	B1WC0026S001	Soil	Uranium-238	1.15	1.1	1.31	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252090	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0035	B1WC0035S001	Soil	Uranium-238	0.97	0.764	0.976	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0036	B1WC0036S001	Soil	Uranium-238	1.37	1.18	1.51	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0037	B1WC0037S001	Soil	Uranium-238	1.8	1.59	1.4		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	B1-2	B1WC0038	B1WC0038S001	Soil	Uranium-238	1.12	0.968	1.84	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255147	Waste

Outfall 009 Waste Characterization Sample Locations for B1-2

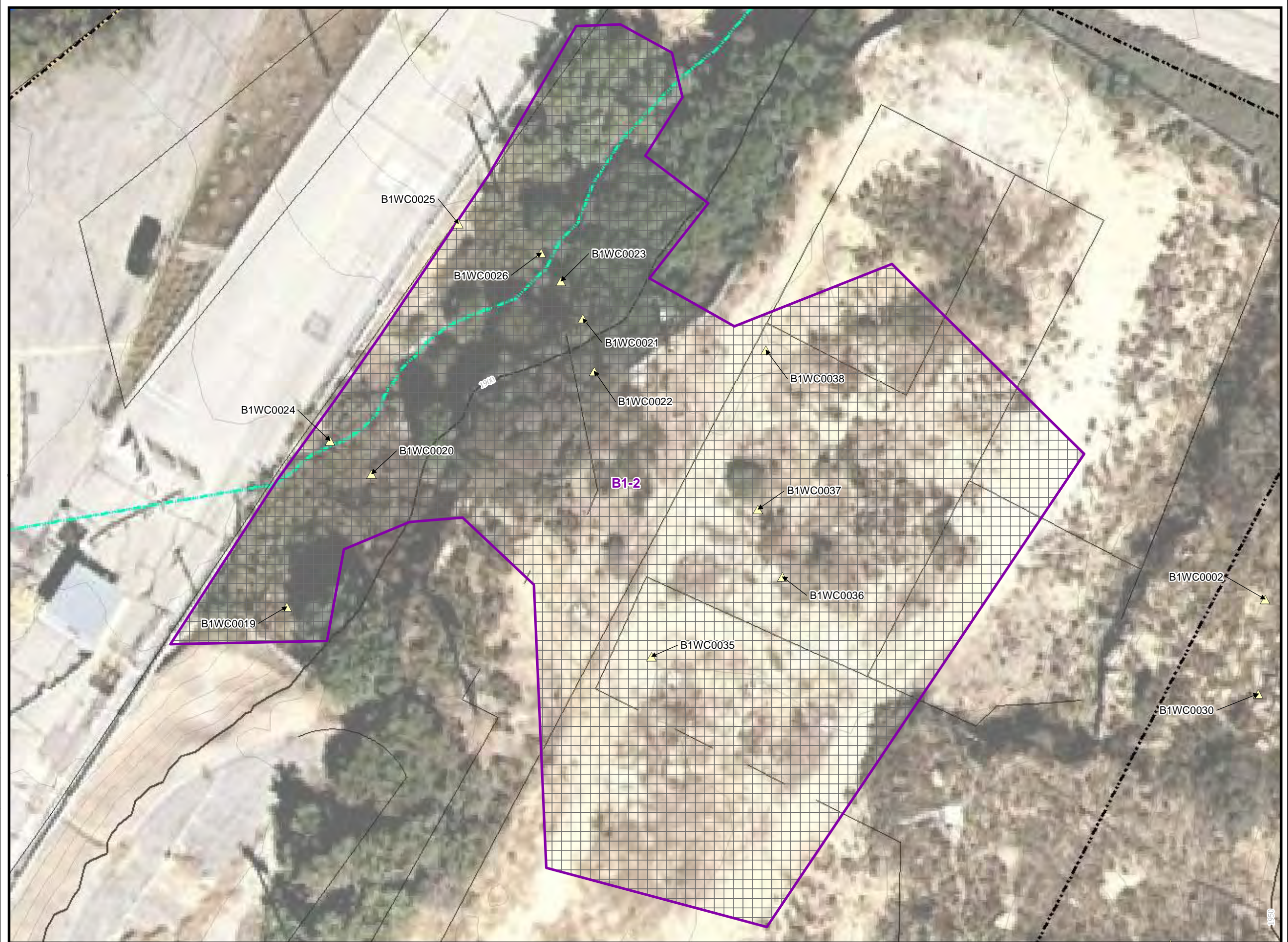
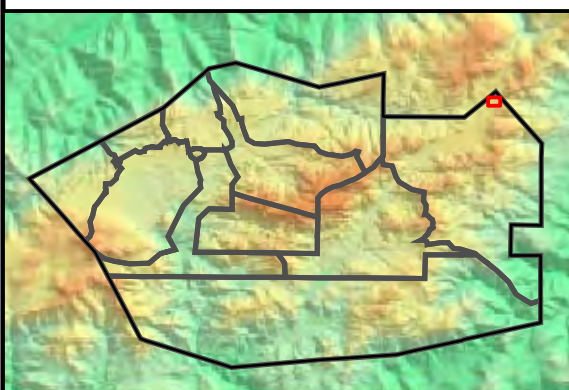
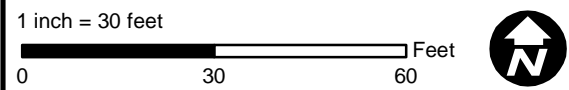
- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Base Map Legend**
- ISRA Excavation Boundary
 - Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_B1-2_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



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

FIGURE 1

**ISRA 009 - Area I - B1-2 Stockpile.
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of the 4 samples taken from the soil in the ISRA 009 B1-2 stockpile. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹.

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 ~0.035 pCi/g and ~0.048 pCi/g respectively. Minimum detectable activity for tritium averaged ~1.0 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.

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 Tables 11 through 18 and Table 20 of the 1995 McLaren/Hart report⁴ and Tables 8-8, 8-10 and 8-14 of the 1993 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." January 19, 1995. <http://www.etec.energy.gov/Health-and-Safety/Documents/BrandeisBardin/AddSoilandWaterSamp.pdf>. Multimedia Sampling Report for the Brandeis-Bardin Institute and Santa Monica Mountains Conservancy", March 10, 1993. http://www.etec.energy.gov/Health-and-Safety/Documents/BrandeisBardin/MultMedSamRep_V1.pdf.

⁵ EPA preliminary remediation goals for radionuclides (Effective January 1, 2007) - <http://epa-prgs.ornl.gov/radionuclides/>.

Results and Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, the soil does not exceed local background for Cs-137. All Cs-137 results are non-detect. The mean Cs-137 is 0.006 pCi/g which is less than the mean background Cs-137 of 0.086 pCi/g. The effective incremental dose from background subtracted Cs-137 is therefore zero mrem/y⁶. The highest Cs-137 result is 0.014 pCi/g which is less than the highest background result of 0.213 pCi/g. The highest non-background subtracted, non-detect Cs-137 result is equivalent to an effective dose of 0.0131 mrem/y⁶. See Appendix 3.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, the soil does not exceed local background for Sr-90. All Sr-90 results are non-detect. The mean Sr-90 is 0.012 pCi/g which is less than the mean background Sr-90 of 0.049 pCi/g. The effective incremental dose from background subtracted Sr-90 is therefore zero mrem/y⁶. The highest Sr-90 result is 0.039 pCi/g which is less than the highest background result of 0.13 pCi/g. The highest non-background subtracted, non-detect Sr-90 result is equivalent to an effective dose of 0.0023 mrem/y⁶. See Appendix 3.

Tritium - All tritium results are non-detect. The average tritium result is 0.018 pCi/g and the highest tritium result is 0.221 pCi/g. The effective incremental dose from mean non-background subtracted tritium is therefore 0.0038 mrem/y⁶. The highest non-detected, non-background subtracted tritium result is equivalent to an effective dose of 0.0471 mrem/y⁶. See Appendix 3.

This waste is certified to be “radiologically” acceptable for shipment to, and disposal at, any waste disposal facility. The waste requires no further radiological controls.

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

⁶ EPA dose compliance considerations for radionuclides (Effective August 3, 2010) - <http://epa-dccs.ornl.gov/>. Soil concentrations that meet the 10⁻⁶ residential risk PRG are < 0.5 mrem/y. The Cs-137 residential PRG of 0.0597 pCi/g is equivalent to 0.056 mrem/y. The Sr-90 residential PRG of 0.231 pCi/g is equivalent to 0.014 mrem/y. The tritium residential PRG of 2.28 pCi/g is equivalent to 0.486 mrem/y. See Appendix 3.

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 8 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>

The Governor's Executive Order D-62-02 prohibits the *"disposal of decommissioned materials to Class III landfills or unclassified management units."* The soil 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 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

Area I - B1-2 Stockpile

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	B1ST0001S001	B1-2	9/2/2010	261989	0.00335	0.0197	0.0351	NDA	0.0109	0.0265	0.0474	NDA	0.15	0.61	1.04	NDA
2	B1ST0002S001	B1-2	9/2/2010	261989	-0.00535	0.0172	0.0304	NDA	-0.0102	0.0241	0.0487	NDA	0.105	0.598	1.03	NDA
3	B1ST0003S001	B1-2	9/2/2010	261989	0.0144	0.0189	0.0345	NDA	0.00985	0.0271	0.0486	NDA	0.221	0.604	1.03	NDA
4	B1ST0004S001	B1-2	9/2/2010	261989	0.0131	0.0272	0.0391	NDA	0.0389	0.0303	0.0483	NDA	-0.405	0.576	1.01	NDA

	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?
Average	0.006		0.035		0.012		0.048		0.018		1.028	
Maximum	0.014		0.039		0.039		0.049		0.221		1.040	
Minimum	-0.005		0.030		-0.010		0.047		-0.405		1.010	
Count				4				4				4
Number of Non-Detects				4				4				4
% Non-Detects				100%				100%				100%

Area I - B1-2 Stockpile

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

The Wilcoxon Rank Sum method 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 by more than the DCGL.

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background by more than the DCGL.

How to use this template:

- 1) Enter analysis results in Data Tab.
- 2) The Wilcoxon Rank Sum test is prescribed in, NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

Derived Concentration Guideline Level, DCGL (pCi/g)	0.00
Type I Error Rate, alpha:	0.05
Type II Error Rate, beta:	0.05
Number of Background Samples, m:	53
Number of Survey Samples, n:	4
z-value for alpha	1.645
No. of groups of tied measurements, g	11
Critical Value (excluding ties)	1589.7
Critical Value (including ties)	1589.6
Sum of Reference Ranks	1643.0
Sum of Survey Ranks	10.0
Sum of All Ranks	1653
Check Rank Sum $(n+m)*(n+m+1)/2$	1653

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	0.086	0.006
Max	0.213	0.014
Min	0.015	-0.005
σ	0.061	0.009
$m-1.96*\sigma$	-0.033	-0.012
$m+1.96*\sigma$	0.204	0.024

No.	Soil ID	Year	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1	BG-01-005	1992	0.092	0.092	R	33	33
2	BG-01-008	1992	0.020	0.020	R	11.5	11.5
3	BG-01-016	1994	0.020	0.020	R	11.5	11.5
4	BG-01-034	1994	0.100	0.100	R	38.5	38.5
5	BG-01-082	1994	0.020	0.020	R	11.5	11.5
6	BG-01-087	1994	0.158	0.158	R	49.5	49.5
7	BG-01-090	1994	0.175	0.175	R	52	52
8	BG-01-100	1992	0.180	0.180	R	53	53
9	BG-02-007	1992	0.170	0.170	R	51	51
10	BG-02-007	1994	0.030	0.030	R	20	20
11	BG-02-017	1994	0.213	0.213	R	57	57
12	BG-02-074	1994	0.025	0.025	R	17	17
13	BG-02-074	1992	0.020	0.020	R	11.5	11.5
14	BG-02-076	1992	0.099	0.099	R	36.5	36.5
15	BG-02-076	1994	0.020	0.020	R	11.5	11.5
16	BG-02-085	1994	0.020	0.020	R	11.5	11.5
17	BG-05-016	1992	0.074	0.074	R	29	29
18	BG-05-017	1994	0.147	0.147	R	45	45

No.	Soil ID	Year	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
19	BG-05-026	1992	0.067	0.067	R	27.5	27.5
20	BG-05-027	1994	0.099	0.099	R	36.5	36.5
21	BG-05-050	1994	0.101	0.101	R	40	40
22	BG-05-056	1994	0.148	0.148	R	46	46
23	BG-05-074	1992	0.100	0.100	R	38.5	38.5
24	BG-05-074	1994	0.153	0.153	R	48	48
25	BG-09-003	1994	0.025	0.025	R	17	17
26	BG-09-005	1994	0.188	0.188	R	54	54
27	BG-09-013	1994	0.198	0.198	R	56	56
28	BG-09-057	1994	0.030	0.030	R	20	20
29	BG-09-096	1994	0.079	0.079	R	30	30
30	BG-11-010	1994	0.158	0.158	R	49.5	49.5
31	BG-11-011	1994	0.109	0.109	R	41	41
32	BG-11-031	1994	0.059	0.059	R	26	26
33	BG-11-036	1994	0.067	0.067	R	27.5	27.5
34	BG-11-075	1994	0.113	0.113	R	42	42
35	BG-12-001	1994	0.015	0.015	R	6	6
36	BG-12-002	1994	0.031	0.031	R	22	22
37	BG-12-003	1994	0.042	0.042	R	25	25
38	BG-12-004	1994	0.097	0.097	R	34.5	34.5
39	BG-12-005	1994	0.015	0.015	R	6	6
40	BG-14-001	1994	0.020	0.020	R	11.5	11.5
41	BG-14-002	1994	0.085	0.085	R	32	32
42	BG-14-003	1994	0.080	0.080	R	31	31
43	BG-14-004	1994	0.015	0.015	R	6	6
44	BG-14-005	1994	0.020	0.020	R	11.5	11.5
45	BG-03-001	1992	0.035	0.035	R	23.5	23.5
46	BG-03-019	1992	0.035	0.035	R	23.5	23.5
47	BG-03-059	1992	0.025	0.025	R	17	17
48	BG-04-025	1992	0.150	0.150	R	47	47
49	BG-04-029	1992	0.140	0.140	R	43.5	43.5
50	BG-04-090	1992	0.190	0.190	R	55	55
51	BG-06-033	1992	0.097	0.097	R	34.5	34.5
52	BG-06-089	1992	0.030	0.030	R	20	20
53	BG-06-096	1992	0.140	0.140	R	43.5	43.5
54	B1ST0001S001	2010	0.003	0.003	S	2	0
55	B1ST0002S001	2010	-0.005	-0.005	S	1	0
56	B1ST0003S001	2010	0.014	0.014	S	4	0
57	B1ST0004S001	2010	0.013	0.013	S	3	0
Sum						1653.0	1643.0

Area I - B1-2 Stockpile

Wilcoxon Rank Sum Test -- (Strontium-90)

General Information:

The Wilcoxon Rank Sum method 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 by more than the DCGL.

The alternative hypothesis, H_a , is: Survey sample concentrations do not exceed those in the background by more than the DCGL.

How to use this template:

- 1) Enter analysis results in Data Tab.
- 2) The Wilcoxon Rank Sum test is prescribed in, NUREG-1505, Nuclear Regulatory Commission, "A Non-parametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys." January 1998.

Derived Concentration Guideline Level, DCGL (pCi/g)	0.00
Type I Error Rate, alpha:	0.05
Type II Error Rate, beta:	0.05
Number of Background Samples, m:	53
Number of Survey Samples, n:	4
z-value for alpha	1.645
No. of groups of tied measurements, g	10
Critical Value (excluding ties)	1589.7
Critical Value (including ties)	1589.3
Sum of Reference Ranks	1619.0
Sum of Survey Ranks	34.0
Sum of All Ranks	1653
Check Rank Sum $(n+m)*(n+m+1)/2$	1653

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	0.049	0.012
Max	0.130	0.039
Min	0.005	-0.010
σ	0.030	0.020
$m-1.96*\sigma$	-0.010	-0.027
$m+1.96*\sigma$	0.109	0.052

No.	Soil ID	Year	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1	BG-01-005	1992	0.030	0.030	R	17.5	17.5
2	BG-01-008	1992	0.010	0.010	R	5.5	5.5
3	BG-01-016	1994	0.045	0.045	R	32	32
4	BG-01-034	1994	0.050	0.050	R	41.5	41.5
5	BG-01-082	1994	0.040	0.040	R	24.5	24.5
6	BG-01-087	1994	0.035	0.035	R	20.5	20.5
7	BG-01-090	1994	0.050	0.050	R	41.5	41.5
8	BG-01-100	1992	0.050	0.050	R	41.5	41.5
9	BG-02-007	1992	0.020	0.020	R	10.5	10.5
10	BG-02-007	1994	0.130	0.130	R	56.5	56.5
11	BG-02-017	1994	0.120	0.120	R	55	55
12	BG-02-074	1994	0.040	0.040	R	24.5	24.5
13	BG-02-074	1992	0.005	0.005	R	2.5	2.5
14	BG-02-076	1992	0.030	0.030	R	17.5	17.5
15	BG-02-076	1994	0.045	0.045	R	32	32
16	BG-02-085	1994	0.130	0.130	R	56.5	56.5
17	BG-05-016	1992	0.050	0.050	R	41.5	41.5
18	BG-05-017	1994	0.088	0.088	R	50	50
19	BG-05-026	1992	0.080	0.080	R	47	47

No.	Soil ID	Year	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
20	BG-05-027	1994	0.100	0.100	R	54	54
21	BG-05-050	1994	0.069	0.069	R	46	46
22	BG-05-056	1994	0.097	0.097	R	52	52
23	BG-05-074	1992	0.050	0.050	R	41.5	41.5
24	BG-05-074	1994	0.084	0.084	R	49	49
25	BG-10-001	1994	0.098	0.098	R	53	53
26	BG-10-002	1994	0.045	0.045	R	32	32
27	BG-10-003	1994	0.045	0.045	R	32	32
28	BG-10-004	1994	0.020	0.020	R	10.5	10.5
29	BG-10-005	1994	0.045	0.045	R	32	32
30	BG-11-010	1994	0.089	0.089	R	51	51
31	BG-11-011	1994	0.050	0.050	R	41.5	41.5
32	BG-11-031	1994	0.045	0.045	R	32	32
33	BG-11-036	1994	0.050	0.050	R	41.5	41.5
34	BG-11-075	1994	0.045	0.045	R	32	32
35	BG-12-001	1994	0.040	0.040	R	24.5	24.5
36	BG-12-002	1994	0.045	0.045	R	32	32
37	BG-12-003	1994	0.045	0.045	R	32	32
38	BG-12-004	1994	0.045	0.045	R	32	32
39	BG-12-005	1994	0.025	0.025	R	14.5	14.5
40	BG-14-001	1994	0.082	0.082	R	48	48
41	BG-14-002	1994	0.045	0.045	R	32	32
42	BG-14-003	1994	0.040	0.040	R	24.5	24.5
43	BG-14-004	1994	0.035	0.035	R	20.5	20.5
44	BG-14-005	1994	0.025	0.025	R	14.5	14.5
45	BG-03-001	1992	0.005	0.005	R	2.5	2.5
46	BG-03-019	1992	0.020	0.020	R	10.5	10.5
47	BG-03-059	1992	0.010	0.010	R	5.5	5.5
48	BG-04-025	1992	0.020	0.020	R	10.5	10.5
49	BG-04-029	1992	0.020	0.020	R	10.5	10.5
50	BG-04-090	1992	0.050	0.050	R	41.5	41.5
51	BG-06-033	1992	0.030	0.030	R	17.5	17.5
52	BG-06-089	1992	0.030	0.030	R	17.5	17.5
53	BG-06-096	1992	0.020	0.020	R	10.5	10.5
54	B1ST0001S001	2010	0.011	0.011	S	7	0
55	B1ST0002S001	2010	-0.010	-0.010	S	1	0
56	B1ST0003S001	2010	0.010	0.010	S	4	0
57	B1ST0004S001	2010	0.039	0.039	S	22	0
Sum						1653.0	1619.0

Appendix 2
Radionuclide Results

Appendix 3
Dose and Risk

ISRA 009 - Area I - B1-2 Stockpile

Dose & Risk from Soil Using EPA's 2007-01-01 PRGs¹ and 2010-08-03 DCCs²

Parameter	Equation	Units	Cs-137	Sr-90	H-3
Maximum soil concentration	X_{max}	pCi/g	0.014	0.039	0.221
Mean soil concentration	X_{mean}	pCi/g	0.006	0.012	0.018
Mean background soil concentration	$X_{mean, bkgd}$	pCi/g	0.086	0.049	0

Residential					
Parameter	Equation	Units	Cs-137	Sr-90	H-3
EPA 10^{-6} PRG ¹	PRG	pCi/g per 10^{-6} risk	0.0597	0.231	2.28
EPA 1 mrem/y DCC ²	DCC	pCi/g per mrem/y	1.07	16.9	4.69
Dose from PRG	PRG / DCC	mrem/y per 10^{-6} risk	0.056	0.014	0.486
Risk from DCC	$(DCC / PRG) * 10^{-6}$	Risk per mrem/y	1.8E-05	7.3E-05	2.1E-06
Dose from maximum soil	X_{max} / DCC	mrem/y	0.0131	0.0023	0.0471
Dose from mean soil	X_{mean} / DCC	mrem/y	0.0056	0.0007	0.0038
Dose from mean background-subtracted soil	$(X_{mean} - X_{mean, bkgd}) / DCC$	mrem/y	0.0000	0.0000	0.0038
Risk from maximum soil	$(X_{max} / PRG) * 10^{-6}$	Risk	2.3E-07	1.7E-07	9.7E-08
Risk from mean soil	$(X_{mean} / PRG) * 10^{-6}$	Risk	1.0E-07	5.2E-08	7.9E-09
Risk from mean background-subtracted soil	$(X_{mean} - X_{mean, bkgd}) * 10^{-6} / PRG$	Risk	0.0E+00	0.0E+00	7.9E-09

1. PRG = EPA preliminary remediation goals. Dated 2007-01-01.
 2. DCC = EPA dose compliance considerations. Dated 2010-08-03. Downloaded 2010-08-20.

<http://epa-prgs.ornl.gov/radionuclides/>
<http://epa-dccs.ornl.gov/>

B1 Buried Pipe, Area I - Radiological Release Survey and Waste Certification

This data package provides the radiation survey results of the buried pipe debris at B1 ISRA location in Area I of SSFL. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹ and with Boeing procedure RS-00012².

Instrument measurements were made for beta/gamma total surface contamination (Ludlum 3 plus Ludlum 44-9 GM probe) and gamma exposure rate (Bicron microrem meter). Wipes were taken for removable alpha/beta contamination and counted in a low-background Tennelec laboratory alpha/beta counter.

Instrument minimum detectable activity (MDA) for total contamination measurements are <5,000 dpm/100 cm² beta (Ludlum 44-9 probe). Removable contamination MDAs for the Tennelec are 13 dpm/100 cm² alpha and 20 dpm/100 cm² beta. The Bicron MDA is ~4 µR/hr. Survey results are provided in Appendix 1.

Conclusions

Results of all field measurements were non-detect (i.e. less than the MDA) and are therefore indistinguishable from background. The dose from any resulting post-demolition solid debris is therefore zero mrem per year. If it were conservatively assumed that the debris was actually contaminated at the MDA levels, then the effective dose would be much less than 1 mrem per year^{3,4}.

This debris meets the most restrictive regulatory surface contamination limits^{5,6,7} for release/clearance of equipment and material for unrestricted use from former radiological facilities. B1 is not a former radiological facility.

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 Boeing, "Methods and Procedures for Radiological Monitoring." RS-00012, Revision B, August 6, 2006.

³ ANSI N13.12-1999. "Surface and Volume Radioactivity Standards for Clearance." American National Standards Institute/Health Physics Society, 1999. The most limiting beta/gamma screening value is 6,000 dpm/100 cm² corresponding to a dose of 1 mrem per year. The most limiting alpha screening value is 600 dpm/100 cm² corresponding to a dose of 1 mrem per year.

⁴ NUREG-1640. "Radiological Assessments for Clearance of Materials from Nuclear Facilities." Nuclear Regulatory Commission, June 2003. The most restrictive beta/gamma dose conversion from Table 2.1 is 0.16 µrem/y per dpm/100 cm². This corresponds to 0.8 mrem/y per 5,000 dpm/100 cm².

⁵ U.S. Nuclear Regulatory Commission Regulatory Guide 1.86. "Termination of Operating Licenses for Nuclear Reactors." June 1974. and U.S. NRC "Guidelines for Decontamination of Facilities and Equipment Prior to Release to Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," August 1987.

The debris is certified to be radiologically acceptable for off-site disposal and/or recycling. There are no radiological controls or restrictions imposed on future disposition or use of this debris.

This waste meets the requirements of disposal facility permits^{8,9} and complies with the California Health & Safety Code¹⁰.

The Governor's Executive Order D-62-02 (September 2002) prohibits the "*disposal of decommissioned materials to Class 3 landfills or unclassified management units.*" The subject debris is not decommissioned material, and has not originated from a radiological facility. The survey in this certification has therefore been conducted as a best management practice, that also complies with the requirements of D-62-02. Verification surveys 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 material¹¹.

⁶ U.S. Department of Energy Order 5400.5. "Radiation Protection of the Public and Environment." Chapter IV. January 7, 1993. and U.S. Department of Energy Guide DOE G 441.1-XX. "Control and Release of Property with Residual Radioactive Material." April 4, 2002.

⁷ California Department of Public Health. DECON-1. "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use." and IPM-88-2. "Clearance Inspection and Survey." December 1, 1997.

⁸ This waste is exempt from regulation and licensing or is expressly authorized for disposal under the Radiation Control Law (Division 104, Part 9, Chapter 8 of the California Health & Safety Code).

⁹ This waste is not prohibited from disposal by any government agency with jurisdictional authority over this waste.

¹⁰ 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>

¹¹ 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.*"

A handwritten signature in black ink that reads "Phil Rutherford".

Phil Rutherford
Manager, Health, Safety & Radiation Services

Appendix 1
Field Survey Results

Sample Report

Batch ID:	Smears 1 Minute Count - 201008301451	Count Date:	8/30/2010 2:51:40PM
Group:	D	Count Minutes:	1.00
Device:	RMHF Tennelec (NR 007137)	Count Mode:	Simultaneous
Batch Key:	1442	Operating Volts:	1425
Selected	Swipe/Smear	Comments:	Pipes

Background (cpm)		Efficiency (%)	
Alpha Rate:	0.10 ± 0.10	Alpha:	31.16 ± 0.93
Beta Rate:	2.00 ± 0.45	Beta:	39.39 ± 1.00

<u>Sample ID</u>	<u>Sample Type</u>	<u>Alpha (dpm)</u>	<u>Unc</u>	<u>Alpha MDA (dpm)</u>	<u>Beta (dpm)</u>	<u>Unc</u>	<u>Beta MDA (dpm)</u>
1	Unknown	2.89	3.23	13.00	-2.54	2.78	20.00
2	Unknown	-0.32	0.32	13.00	0.00	3.77	20.00

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA OUTFALL 009 PLANNED EXCAVATION CTLI-1A

Introduction

This report presents supporting detailed information for the April 27, 2010 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area I, near the former CTL-I facility.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area I 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 I 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 guidelines presented in U.S. EPA SW-846 are followed in evaluating the adequacy of sampling and the application of analytical results to regulatory thresholds. 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. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation CTLI-1A was based partly on the Group 1A RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals, Semi-Volatile Organic Compounds (SVOC), Fluoride, and Corrosivity should be addressed in the CTLI-1A excavation footprint. A random sampling plan was developed for collection of Eight (8) samples from the planned excavation footprint, taking into account the relatively small area to be excavated. The samples were analyzed for CAM 17 metals, SVOCs, Fluoride, and pH. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the CTLI-1A planned excavation area are presented in GEL Laboratories reports 251896 issued on 5/7/10 and 252520 issued on 5/14/10. Regulated Metals were far below 10-Times their respective California Soluble Threshold Limits (STLC) in all cases, with the exception of one sample that exhibited Lead at 62.6 parts per million (ppm). This is slightly above the 50 ppm 10X STLC threshold. The Lead concentrations in the other 7 samples ranged between 8.86 ppm and 18.9 ppm. Subsequent analysis of the elevated sample, as required, by

the California Waste Extraction Test (WET) for leaching properties resulted in a concentration of 0.256 milligrams per liter (mg/L), well below the 5 mg/L STLC hazardous waste limit.

Very low concentrations of some SVOCs were detected in the soil samples from CTLI-1A, none of which were above the parts per billion level. Specific hazardous waste thresholds have been established in the regulations for only a small number of SVOCs. There were no exceedances of established limits. Furthermore, none of the detected SVOCs exceeded U.S. EPA Region IX "Preliminary Remediation Goals" values for residential soils.

Low concentrations of Fluoride were detected in the samples. These ranged between 1.41 ppm and 3.89 ppm. These concentrations are far below the 10X STLC threshold of 1,800 ppm. No specific regulatory Limit has been established for Fluoride under the Resource Conservation and Recovery Act.

The pH of the soil being characterized was in the neutral range, with a maximum of 7.56 and a minimum of 6.24.

Determination

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

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 if it is applied to 22 CCR 66261.24(a)(7)

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 CTLI-1A is NON-HAZARDOUS.

Outfall 009 Waste Characterization Sample Locations for CTLI-1A

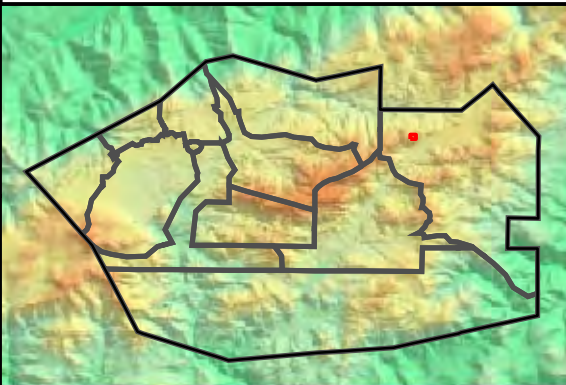
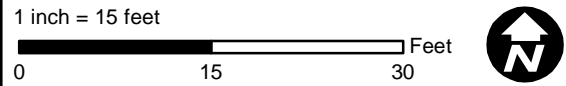
- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Base Map Legend**
- ISRA Excavation Boundary
 - Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_CTLI-1A_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



SANTA SUSANA FIELD LABORATORY

FIGURE 1

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – CTLI-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				<table border="1"> <tr> <td>Object Name:</td> <td>C1WC0001</td> <td>C1WC0002</td> <td>C1WC0003</td> <td>C1WC0004</td> <td>C1WC0005</td> <td>C1WC0006</td> <td>C1WC0007</td> <td>C1WC0008</td> </tr> <tr> <td>Sample Name:</td> <td>C1WC0001S001</td> <td>C1WC0002S001</td> <td>C1WC0003S001</td> <td>C1WC0004S001</td> <td>C1WC0005S001</td> <td>C1WC0006S001</td> <td>C1WC0007S001</td> <td>C1WC0008S001</td> </tr> <tr> <td>Collection Date:</td> <td>4/27/2010</td> <td>4/27/2010</td> <td>4/27/2010</td> <td>4/27/2010</td> <td>4/27/2010</td> <td>4/27/2010</td> <td>4/27/2010</td> <td>4/27/2010</td> </tr> <tr> <td>Sample Depth (feet):</td> <td>0.0 - 0.5</td> <td>5.0 - 5.5</td> <td>3.0 - 3.5</td> <td>1.0 - 1.5</td> <td>1.5 - 2.0</td> <td>2.0 - 2.5</td> <td>1.5 - 2.0</td> <td>0.5 - 1.0</td> </tr> </table>										Object Name:	C1WC0001	C1WC0002	C1WC0003	C1WC0004	C1WC0005	C1WC0006	C1WC0007	C1WC0008	Sample Name:	C1WC0001S001	C1WC0002S001	C1WC0003S001	C1WC0004S001	C1WC0005S001	C1WC0006S001	C1WC0007S001	C1WC0008S001	Collection Date:	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	Sample Depth (feet):	0.0 - 0.5	5.0 - 5.5	3.0 - 3.5	1.0 - 1.5	1.5 - 2.0	2.0 - 2.5	1.5 - 2.0	0.5 - 1.0
Object Name:	C1WC0001	C1WC0002	C1WC0003	C1WC0004	C1WC0005	C1WC0006	C1WC0007	C1WC0008																																									
Sample Name:	C1WC0001S001	C1WC0002S001	C1WC0003S001	C1WC0004S001	C1WC0005S001	C1WC0006S001	C1WC0007S001	C1WC0008S001																																									
Collection Date:	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010																																									
Sample Depth (feet):	0.0 - 0.5	5.0 - 5.5	3.0 - 3.5	1.0 - 1.5	1.5 - 2.0	2.0 - 2.5	1.5 - 2.0	0.5 - 1.0																																									
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger^a	TCLP Leachate Testing Trigger^b	STLC	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c	RESULT^c																																				
METALS																																																	
Antimony	mg/kg	500	150	--	--	0.26	0.296	0.254	0.225	0.286	0.319	0.263	0.233																																				
Arsenic	mg/kg	500	50	100	--	12.5	10	13.1	5.04	6.59	11.2	10.7	7.99																																				
Barium	mg/kg	10,000	1,000	2,000	--	117	89.5	112	80.2	183	98.9	92.9	105																																				
Beryllium	mg/kg	75	7.5	--	--	1.02	0.654	0.905	0.359	0.544	0.789	0.745	0.582																																				
Cadmium	mg/kg	100	10	20	--	0.274	0.0948 J	0.106	0.137	0.249	0.151	0.0848 J	0.236																																				
Chromium	mg/kg	500	50	100	--	24.3	20.1	24.1	21.6	20.3	22.8	21.6	20.1																																				
Cobalt	mg/kg	8,000	800	--	--	9.24	5.38	8.87	5.41	5.9	6.37	7.46	6.69																																				
Copper	mg/kg	2,500	250	--	--	16.8	10.4	15.1	8.01	11.9	13.4	12.7	12.8																																				
Lead	mg/kg	1,000	50	100	--	13.4	13.8	11.9	14.7	62.6	18.1	8.86	18.9																																				
Lead, WET	mg/L	--	--	--	5	--	--	--	--	0.256	--	--	--																																				
Mercury	mg/kg	20	2	4	--	<0.0112	<0.0113	<0.0111	0.0122 J	<0.0113	<0.0113	<0.0112	<0.0111																																				
Molybdenum	mg/kg	3,500	3,500	--	--	0.761	0.964	0.739	0.645	0.709	0.683	0.612	0.744																																				
Nickel	mg/kg	2,000	200	--	--	16.7	11.9	15.5	13.5	13.6	13.4	14.9	12.6																																				
Selenium	mg/kg	100	10	20	--	0.278 J	0.36 J	0.254 J	0.137 J	0.181 J	0.25 J	0.216 J	0.172 J																																				
Silver	mg/kg	500	50	100	--	0.0843 J	0.0282 J	0.0909 J	0.0462 J	0.0493 J	0.0475 J	0.0567 J	0.0373 J																																				
Thallium	mg/kg	700	70	--	--	0.307	0.285	0.375	0.228	0.232	0.318	0.313	0.266																																				
Vanadium	mg/kg	2,400	240	--	--	40.8	36.8	42.3	36.7	35.1	37.3	38.5	37.8																																				
Zinc	mg/kg	5,000	2,500	--	--	147	80	80.3	58.1	145.0	105	65.1	407																																				
General Chemistry																																																	
Fluoride	mg/kg	18,000	1,800	--	--	3.32	1.53	2.36	3.89	1.61	1.41	1.61	1.75																																				
pH	SU	--	--	--	--	7.56 H	6.8 H	6.24 H	6.36 H	6.78 H	6.45 H	6.77 H	6.87 H																																				
SVOCs																																																	
1,1'-Biphenyl	ug/kg	--	--	--	--	<332 {<99.6}	<332 {<99.6}	<331 {<99.4}	<332 {<99.6}	<332 {<99.6}	<332 {<99.6}	<332 {<99.5}	<332 {<99.7}																																				
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}																																				
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}																																				
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}																																				
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}																																				
1-Naphthylamine	ug/kg	--	--	--	--	<332 {<99.6}	<332 {<99.6}	<331 {<99.4}	<332 {<99.6}	<332 {<99.6}	<332 {<99.6}	<332 {<99.5}	<332 {<99.7}																																				
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}																																				
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}																																				
2,4-Dichlorophenol	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}																																				
2,4-Dimethylphenol	ug/kg	--	--	--	--	<332 {<116}	<332 {<116}	<331 {<116}	<332 {<116}	<332 {<116}	<332 {<116}	<332 {<116}	<332 {<116}																																				
2,4-Dinitrophenol	ug/kg	--	--	--	--	<664 {<126}	<664 {<126}	<663 {<126}	<664 {<126}	<664 {<126}	<664 {<126}	<664 {<126}	<664 {<126}																																				
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<332 {<33.2}	<332 {<33.2}	<331 {<33.1}	<332 {<33.2}	<332 {<33.2}	<332 {<33.2}	<332 {<33.2}	<332 {<33.2}																																				
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<332 {<33.2}	<332 {<33.2}	<331 {<33.1}	<332 {<33.2}	<332 {<33.2}	<332 {<33.2}	<332 {<33.2}	<332 {<33.2}																																				

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – CTLI-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	C1WC0001	C1WC0002	C1WC0003	C1WC0004	C1WC0005	C1WC0006	C1WC0007	C1WC0008	
				Sample Name:	C1WC0001S001	C1WC0002S001	C1WC0003S001	C1WC0004S001	C1WC0005S001	C1WC0006S001	C1WC0007S001	C1WC0008S001	
				Collection Date:	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	
				Sample Depth (feet):	0.0 - 0.5	5.0 - 5.5	3.0 - 3.5	1.0 - 1.5	1.5 - 2.0	2.0 - 2.5	1.5 - 2.0	0.5 - 1.0	
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
2-Chloronaphthalene	ug/kg	--	--	--	--	<33.2 {<11}	<33.2 {<11}	<33.1 {<10.9}	<33.2 {<11}	<33.2 {<11}	<33.2 {<11}	<33.2 {<10.9}	<33.2 {<11}
2-Chlorophenol	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
2-Methylnaphthalene	ug/kg	--	--	--	--	<33.2 {<6.64}	<33.2 {<6.64}	<33.1 {<6.63}	<33.2 {<6.64}	<33.2 {<6.64}	<33.2 {<6.64}	<33.2 {<6.64}	<33.2 {<6.64}
2-Methylphenol	ug/kg	--	--	200	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
2-Naphthylamine	ug/kg	--	--	--	--	<332 {<110}	<332 {<110}	<331 {<109}	<332 {<110}	<332 {<110}	<332 {<110}	<332 {<109}	<332 {<110}
2-Nitroaniline	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
2-Nitrophenol	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
3,3-Dichlorobenzidine	ug/kg	--	--	--	--	<332 {<99.6}	<332 {<99.6}	<331 {<99.4}	<332 {<99.6}	<332 {<99.6}	<332 {<99.6}	<332 {<99.5}	<332 {<99.7}
3-Nitroaniline	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
4-Aminobiphenyl	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
4-Chloroaniline	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
4-Chlorophenyl-phenylether	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
4-Methylphenol	ug/kg	--	--	200	--	<332 {<99.6}	<332 {<99.6}	<331 {<99.4}	<332 {<99.6}	<332 {<99.6}	<332 {<99.6}	<332 {<99.5}	<332 {<99.7}
4-Nitroaniline	ug/kg	--	--	--	--	<332 {<99.6}	<332 {<99.6}	<331 {<99.4}	<332 {<99.6}	<332 {<99.6}	<332 {<99.6}	<332 {<99.5}	<332 {<99.7}
4-Nitrophenol	ug/kg	--	--	--	--	<332 {<110}	<332 {<110}	<331 {<109}	<332 {<110}	<332 {<110}	<332 {<110}	<332 {<109}	<332 {<110}
Acenaphthene	ug/kg	--	--	--	--	<33.2 {<11}	<33.2 {<11}	<33.1 {<10.9}	<33.2 {<11}	<33.2 {<11}	<33.2 {<11}	<33.2 {<10.9}	<33.2 {<11}
Acenaphthylene	ug/kg	--	--	--	--	<33.2 {<9.96}	<33.2 {<9.96}	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Acetophenone	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Anthracene	ug/kg	--	--	--	--	<33.2 {<6.64}	<33.2 {<6.64}	<33.1 {<6.63}	<33.2 {<6.64}	<33.2 {<6.64}	<33.2 {<6.64}	7.14 J	<33.2 {<6.64}
Atrazine	ug/kg	--	--	--	--	<332 {<99.6}	<332 {<99.6}	<331 {<99.4}	<332 {<99.6}	<332 {<99.6}	<332 {<99.6}	<332 {<99.5}	<332 {<99.7}
Benzaldehyde	ug/kg	--	--	--	--	<332 {<99.6}	<332 {<99.6}	<331 {<99.4}	<332 {<99.6}	<332 {<99.6}	<332 {<99.6}	<332 {<99.5}	<332 {<99.7}
Benzidine	ug/kg	--	--	--	--	<332 {<99.6}	<332 {<99.6}	<331 {<99.4}	<332 {<99.6}	<332 {<99.6}	<332 {<99.6}	<332 {<99.5}	<332 {<99.7}
Benzo(a)anthracene	ug/kg	--	--	--	--	<33.2 {<9.96}	<33.2 {<9.96}	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Benzo(a)pyrene	ug/kg	--	--	--	--	<33.2 {<9.96}	24.3 J	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Benzo(b)fluoranthene	ug/kg	--	--	--	--	10.2 J	39	<33.1 {<9.94}	<33.2 {<9.96}	15.7 J	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Benzo(ghi)perylene	ug/kg	--	--	--	--	<33.2 {<9.96}	21.2 J	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<33.2 {<9.96}	15.9 J	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Butyl benzyl phthalate	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Caprolactam	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – CTLI-1A
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				Object Name:	C1WC0001	C1WC0002	C1WC0003	C1WC0004	C1WC0005	C1WC0006	C1WC0007	C1WC0008	
				Sample Name:	C1WC0001S001	C1WC0002S001	C1WC0003S001	C1WC0004S001	C1WC0005S001	C1WC0006S001	C1WC0007S001	C1WC0008S001	
				Collection Date:	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	4/27/2010	
				Sample Depth (feet):	0.0 - 0.5	5.0 - 5.5	3.0 - 3.5	1.0 - 1.5	1.5 - 2.0	2.0 - 2.5	1.5 - 2.0	0.5 - 1.0	
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Carbazole	ug/kg	--	--	--	--	<33.2 {<9.96}	<33.2 {<9.96}	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Chrysene	ug/kg	--	--	--	--	<33.2 {<9.96}	19.8 J	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<33.2 {<9.96}	<33.2 {<9.96}	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Dibenzofuran	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Diethyl phthalate	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Dimethyl phthalate	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Di-n-butyl phthalate	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Di-n-octyl phthalate	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Diphenylamine	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Fluoranthene	ug/kg	--	--	--	--	<33.2 {<9.96}	19.5 J	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Fluorene	ug/kg	--	--	--	--	<33.2 {<9.96}	<33.2 {<9.96}	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Hexachlorobenzene	ug/kg	--	--	2,600	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Hexachloroethane	ug/kg	--	--	60,000	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	56	68	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Isophorone	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Naphthalene	ug/kg	--	--	--	--	<33.2 {<9.96}	<33.2 {<9.96}	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Nitrobenzene	ug/kg	--	--	40,000	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
n-Nitrosodimethylamine	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<332 {<83}	<332 {<83}	<331 {<82.8}	<332 {<83}	<332 {<83}	<332 {<83}	<332 {<82.9}	<332 {<83.1}
Phenanthrene	ug/kg	--	--	--	--	<33.2 {<9.96}	<33.2 {<9.96}	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Phenol	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
Pyrene	ug/kg	--	--	--	--	<33.2 {<9.96}	19.5 J	<33.1 {<9.94}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.96}	<33.2 {<9.95}	<33.2 {<9.97}
Pyridine	ug/kg	--	--	--	--	<332 {<66.4}	<332 {<66.4}	<331 {<66.3}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}	<332 {<66.4}
RADIONUCLIDES	--	--	--	--	--	R	R	R	R	R	R	R	R

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**FOOTNOTES, WASTE CHARACTERIZATION SAMPLE RESULTS - CTLI-1
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

H - Analytical holding time was exceeded.

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

SU - standard units

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA OUTFALL 009 PLANNED EXCAVATION CTLI-1B

Introduction

This report presents supporting detailed information for the April 27, 2010 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area I, near the former CTL-I facility.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area I 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 I 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 guidelines presented in U.S. EPA SW-846 are followed in evaluating the adequacy of sampling and the application of analytical results to regulatory thresholds. 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. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation CTLI-1B was based partly on the Group 1A RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals, Semi-Volatile Organic Compounds (SVOC), Fluoride, and Corrosivity should be addressed in the CTLI-1B excavation footprint. Based on random sampling, four (4) sample collection points were identified within the planned excavation footprint. This initial sample size was considered adequate for the relatively small area designated for excavation at CTL1-1B. The samples were analyzed for CAM 17 metals, SVOCs, Fluoride, and pH. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the CTLI-1B planned excavation area are presented in GEL Laboratories reports 251960 issued on 5/7/10, 254951 issued 6/29/10, and 255483 issued on 7/7/10. In two samples Regulated Metals were well below 10-Times their respective California Soluble Threshold Limits (STLC). In the other two samples, however, elevated concentrations of Selenium were detected, one at 10.6 parts per million (ppm) and the other at 11 ppm. These are

slightly above the 10 ppm 10X STLC threshold. The Selenium concentrations in the other 2 samples were 0.329 ppm and 0.336 ppm. Subsequent analysis of the elevated samples, using the California Waste Extraction Test (WET) for leaching properties as required, failed to detect any Selenium in one sample at a Method Detection Level of 0.05 milligrams per liter (mg/L). In the leachate from the other sample, Selenium was detected at a concentration of 0.185 mg/L, well below the 1 mg/L STLC hazardous waste limit.

Very low concentrations of some SVOCs were detected in the soil samples from CTLI-1B, none of which were above the parts per billion level. Specific hazardous waste thresholds have been established in the regulations for only a small number of SVOCs. There were no exceedances of established limits. Furthermore, only one of the detected SVOCs exceeded U.S. EPA Region IX "Preliminary Remediation Goals (PRG)" values for residential soils. Benzo(a)pyrene was detected at 0.228 ppm, while the PRG value is 0.062 ppm.

Low concentrations of Fluoride were detected in the samples. These ranged between 1.31 ppm and 2.51 ppm. These concentrations are far below the 10X STLC threshold of 1,800 ppm. No specific regulatory Limit has been established for Fluoride under the Resource Conservation and Recovery Act.

The pH of the soil being characterized was in the neutral range, with a maximum of 6.9 and a minimum of 6.62.










Determination



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

- 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 if it is applied to 22 CCR 66261.24(a)(7)
 - 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 CTLI-1B is NON-HAZARDOUS.

Outfall 009 Waste Characterization Sample Locations for CTLI-1B

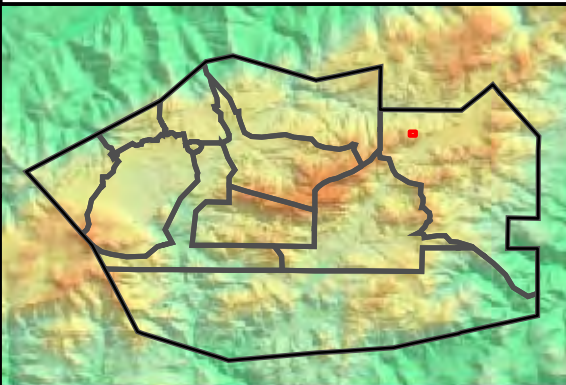
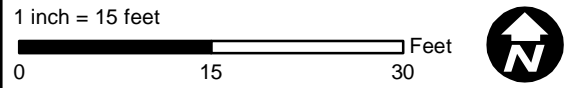
- Base Map Legend**
-  Administrative Area Boundary
 -  RFI Site Boundary
 -  Report Group Boundary
 -  NPDES Outfall
 -  A/C Paving
 -  Drainage
 -  Non Jurisdictional Surface Water Pathway
 -  Surface Water Divide
 -  Elevation Contour

- Base Map Legend**
-  ISRA Excavation Boundary
 -  Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_CTLI-1B_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – CTLI-1B
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	C1WC0009	C1WC0010	C1WC0011	C1WC0012
						Sample Name:	C1WC0009S001	C1WC0010S001	C1WC0011S001	C1WC0012S001
						Collection Date:	4/28/2010	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	2.0 - 2.5	2.0 - 2.5	0.0 - 0.5	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
METALS										
Antimony	mg/kg	500	150	--	--	0.225	0.173 J	<1.6	<0.325	
Arsenic	mg/kg	500	50	100	--	13	11.8	16	15.4	
Barium	mg/kg	10,000	1,000	2,000	--	105	112	172	93.3	
Beryllium	mg/kg	75	7.5	--	--	0.855	0.92	0.465 J	0.182 J	
Cadmium	mg/kg	100	10	20	--	0.106	0.125	<0.484	<0.493	
Chromium	mg/kg	500	50	100	--	26.4	23.2	23.5	21	
Cobalt	mg/kg	8,000	800	--	--	9.07	7.21	9.54	8.22	
Copper	mg/kg	2,500	250	--	--	12.4	14.6	18.7	17	
Lead	mg/kg	1,000	50	100	--	13.9	12.3	10.3	25.4	
Mercury	mg/kg	20	2	4	--	0.0116 J	0.0166 J	0.0151	0.0185	
Molybdenum	mg/kg	3,500	3,500	--	--	1.18	0.868	1.67	1.64	
Nickel	mg/kg	2,000	200	--	--	17.8	15.3	17	12.6	
Selenium	mg/kg	100	10	20	--	0.336 J	0.329 J	10.6	11	
Selenium, WET	mg/L	--	--	--	1	--	--	<0.05	0.185 J	
Silver	mg/kg	500	50	100	--	0.0393 J	0.036 J	<0.484	<0.493	
Thallium	mg/kg	700	70	--	--	0.346	0.311	<0.484	<0.493	
Vanadium	mg/kg	2,400	240	--	--	48.9	40.2	46	40.7	
Zinc	mg/kg	5,000	2,500	--	--	90.5	81.9	70.3	103	
General Chemistry										
Fluoride	mg/kg	18,000	1,800	--	--	2.51	1.66	1.6	1.31	
pH	SU	--	--	--	--	6.62 H	6.73 H	6.63 H	6.9 H	
SVOCs										
1,1'-Biphenyl	ug/kg	--	--	--	--	<166 {<49.9}	<166 {<49.9}	<332 {<99.6}	<333 {<99.9}	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
1-Naphthylamine	ug/kg	--	--	--	--	<166 {<49.9}	<166 {<49.9}	<332 {<99.6}	<333 {<99.9}	
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
2,4-Dichlorophenol	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
2,4-Dimethylphenol	ug/kg	--	--	--	--	<166 {<58.2}	<166 {<58.2}	<332 {<116}	<333 {<117}	
2,4-Dinitrophenol	ug/kg	--	--	--	--	<332 {<63.1}	<333 {<63.2}	<664 {<126}	<666 {<127}	
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<166 {<16.6}	<166 {<16.6}	<332 {<33.2}	<333 {<33.3}	
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<166 {<16.6}	<166 {<16.6}	<332 {<33.2}	<333 {<33.3}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – CTLI-1B
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	C1WC0009	C1WC0010	C1WC0011	C1WC0012
						Sample Name:	C1WC0009S001	C1WC0010S001	C1WC0011S001	C1WC0012S001
						Collection Date:	4/28/2010	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	2.0 - 2.5	2.0 - 2.5	0.0 - 0.5	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
2-Chloronaphthalene	ug/kg	--	--	--	--	<16.6 {<5.48}	<16.6 {<5.49}	<33.2 {<11}	<33.3 {<11}	
2-Chlorophenol	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
2-Methylnaphthalene	ug/kg	--	--	--	--	5.38 J	<16.6 {<3.33}	<33.2 {<6.64}	<33.3 {<6.66}	
2-Methylphenol	ug/kg	--	--	200	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
2-Naphthylamine	ug/kg	--	--	--	--	<166 {<54.8}	<166 {<54.9}	<332 {<110}	<333 {<110}	
2-Nitroaniline	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
2-Nitrophenol	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
3,3-Dichlorobenzidine	ug/kg	--	--	--	--	<166 {<49.9}	<166 {<49.9}	<332 {<99.6}	<333 {<99.9}	
3-Nitroaniline	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
4-Aminobiphenyl	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
4-Chloroaniline	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
4-Chlorophenyl-phenylether	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
4-Methylphenol	ug/kg	--	--	200	--	<166 {<49.9}	<166 {<49.9}	<332 {<99.6}	<333 {<99.9}	
4-Nitroaniline	ug/kg	--	--	--	--	<166 {<49.9}	<166 {<49.9}	<332 {<99.6}	<333 {<99.9}	
4-Nitrophenol	ug/kg	--	--	--	--	<166 {<54.8}	<166 {<54.9}	<332 {<110}	<333 {<110}	
Acenaphthene	ug/kg	--	--	--	--	55.1	<16.6 {<5.49}	<33.2 {<11}	<33.3 {<11}	
Acenaphthylene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.6 {<4.99}	<33.2 {<9.96}	<33.3 {<9.99}	
Acetophenone	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Anthracene	ug/kg	--	--	--	--	153	<16.6 {<3.33}	<33.2 {<6.64}	<33.3 {<6.66}	
Atrazine	ug/kg	--	--	--	--	<166 {<49.9}	<166 {<49.9}	<332 {<99.6}	<333 {<99.9}	
Benzaldehyde	ug/kg	--	--	--	--	<166 {<49.9}	<166 {<49.9}	<332 {<99.6}	<333 {<99.9}	
Benzidine	ug/kg	--	--	--	--	<166 {<49.9}	<166 {<49.9}	<332 {<99.6}	<333 {<99.9}	
Benzo(a)anthracene	ug/kg	--	--	--	--	355	<16.6 {<4.99}	<33.2 {<9.96}	91.9	
Benzo(a)pyrene	ug/kg	--	--	--	--	228	<16.6 {<4.99}	<33.2 {<9.96}	71.9	
Benzo(b)fluoranthene	ug/kg	--	--	--	--	469	<16.6 {<4.99}	<33.2 {<9.96}	164	
Benzo(ghi)perylene	ug/kg	--	--	--	--	51.1	<16.6 {<4.99}	<33.2 {<9.96}	33.5	
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.6 {<4.99}	<33.2 {<9.96}	<33.3 {<9.99}	
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Butyl benzyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Caprolactam	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – CTLI-1B
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	C1WC0009	C1WC0010	C1WC0011	C1WC0012
						Sample Name:	C1WC0009S001	C1WC0010S001	C1WC0011S001	C1WC0012S001
						Collection Date:	4/28/2010	4/28/2010	6/17/2010	6/17/2010
						Sample Depth (feet):	2.0 - 2.5	2.0 - 2.5	0.0 - 0.5	0.0 - 0.5
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Carbazole	ug/kg	--	--	--	--	97.6	<16.6 {<4.99}	<33.2 {<9.96}	<33.3 {<9.99}	
Chrysene	ug/kg	--	--	--	--	303	<16.6 {<4.99}	<33.2 {<9.96}	79.4	
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<16.6 {<4.99}	<16.6 {<4.99}	<33.2 {<9.96}	<33.3 {<9.99}	
Dibenzofuran	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Diethyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Dimethyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Di-n-butyl phthalate	ug/kg	--	--	--	--	43.4 J	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Di-n-octyl phthalate	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Diphenylamine	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Fluoranthene	ug/kg	--	--	--	--	661	<16.6 {<4.99}	<33.2 {<9.96}	122	
Fluorene	ug/kg	--	--	--	--	66.2	<16.6 {<4.99}	<33.2 {<9.96}	<33.3 {<9.99}	
Hexachlorobenzene	ug/kg	--	--	2,600	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Hexachloroethane	ug/kg	--	--	60,000	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	71.1	<16.6 {<4.99}	<33.2 {<9.96}	36.3	
Isophorone	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Naphthalene	ug/kg	--	--	--	--	72.3	<16.6 {<4.99}	<33.2 {<9.96}	<33.3 {<9.99}	
Nitrobenzene	ug/kg	--	--	40,000	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
n-Nitrosodimethylamine	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<166 {<41.5}	<166 {<41.6}	<332 {<83}	<333 {<83.3}	
Phenanthrene	ug/kg	--	--	--	--	498	<16.6 {<4.99}	<33.2 {<9.96}	20.1 J	
Phenol	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
Pyrene	ug/kg	--	--	--	--	506	<16.6 {<4.99}	<33.2 {<9.96}	128	
Pyridine	ug/kg	--	--	--	--	<166 {<33.2}	<166 {<33.3}	<332 {<66.4}	<333 {<66.6}	
RADIONUCLIDES	--	--	--	--	--	R	R	R	R	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – CTLI-1B
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

H - Analytical holding time was exceeded.

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

SU - standard units

**ISRA 009 – CTLI-1.
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of the 12 samples taken at the ISRA Outfall 009, CTLI-1 area. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹.

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 ~0.39 pCi/g and ~0.042 pCi/g respectively. Minimum detectable activity for tritium averaged ~1.0 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.

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.

Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from CTLI-1 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 0.27 +/- 0.057 pCi/g which is similar to the highest background result of 0.213 +/- 0.04 pCi/g. The highest non-background subtracted Cs-137 result is equivalent to an effective dose of 0.19 mrem/y⁶.

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/>.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from CTL-1 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 0.038 pCi/g which is non-detect and less than the highest background result of 0.13 pCi/g. The highest non-background subtracted, non-detect Sr-90 result is equivalent to an effective dose of 0.012 mrem/y⁶.

Tritium - All tritium results are non-detect, the average tritium result is -0.408 pCi/g and the highest tritium result is 0.318 pCi/g. The highest non-detected, non-background subtracted tritium result is equivalent to an effective dose of 0.0045 mrem/y⁶.

This waste is certified to be “radiologically” acceptable for shipment to, and disposal at, any waste disposal facility. The waste requires no further radiological controls.

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 CTLI-1 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 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.

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 8 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>

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*



Phil Rutherford
Manager, Health, Safety & Radiation Services

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)	0.00
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:	12
Z-value for Alpha	1.645
Critical Value	1726
Sum of Reference Ranks	1759

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	0.062
Max	0.213	0.270
Min	0.015	-0.012
σ	0.062	0.093
$m-1.96\sigma$	-0.035	-0.119
$m+1.96\sigma$	0.210	0.244

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1		0.092	0.092	R	37	37
2		0.020	0.020	R	14	14
3		0.020	0.020	R	14	14
4		0.100	0.100	R	41.5	41.5
5		0.020	0.020	R	14	14
6		0.158	0.158	R	53.5	53.5
7		0.175	0.175	R	55	55
8		0.209	0.209	R	60	60
9		0.180	0.180	R	56	56
10		0.030	0.030	R	22	22
11		0.213	0.213	R	61	61
12		0.025	0.025	R	19	19
13		0.020	0.020	R	14	14
14		0.020	0.020	R	14	14
15		0.074	0.074	R	33	33
16		0.147	0.147	R	49	49
17		0.100	0.100	R	41.5	41.5

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
18		0.067	0.067	R	31.5	31.5
19		0.099	0.099	R	40	40
20		0.101	0.101	R	43	43
21		0.148	0.148	R	50	50
22		0.153	0.153	R	52	52
23		0.025	0.025	R	19	19
24		0.188	0.188	R	57	57
25		0.198	0.198	R	59	59
26		0.030	0.030	R	22	22
27		0.079	0.079	R	34	34
28		0.158	0.158	R	53.5	53.5
29		0.109	0.109	R	44	44
30		0.059	0.059	R	29	29
31		0.067	0.067	R	31.5	31.5
32		0.113	0.113	R	45	45
33		0.015	0.015	R	8	8
34		0.031	0.031	R	24	24
35		0.042	0.042	R	28	28
36		0.097	0.097	R	38.5	38.5
37		0.015	0.015	R	8	8
38		0.020	0.020	R	14	14
39		0.085	0.085	R	36	36
40		0.080	0.080	R	35	35
41		0.015	0.015	R	8	8
42		0.020	0.020	R	14	14
43		0.035	0.035	R	26.5	26.5
44		0.035	0.035	R	26.5	26.5
45		0.025	0.025	R	19	19
46		0.150	0.150	R	51	51
47		0.140	0.140	R	47.5	47.5
48		0.190	0.190	R	58	58
49		0.097	0.097	R	38.5	38.5
50		0.030	0.030	R	22	22
51		0.140	0.140	R	47.5	47.5
52	C1WC0001S001	0.013	0.013	S	6	0
53	C1WC0002S001	0.015	0.015	S	10	0
54	C1WC0003S001	-0.012	-0.012	S	1	0
55	C1WC0004S001	0.126	0.126	S	46	0
56	C1WC0005S001	0.067	0.067	S	30	0
57	C1WC0006S001	0.000	0.000	S	2	0
58	C1WC0007S001	0.004	0.004	S	3	0
59	C1WC0008S001	0.011	0.011	S	5	0
60	C1WC0009S001	0.033	0.033	S	25	0
61	C1WC0010S001	0.006	0.006	S	4	0
62	C1WC0011S001	0.215	0.215	S	62	0
63	C1WC0012S001	0.270	0.270	S	63	0
Sum					2016	1759

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, Ho, is: Survey sample concentrations exceed those in the background

The alternative hypothesis, Ha, 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)	0.00
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:	12
Z-value for Alpha	1.645
Critical Value	1726
Sum of Reference Ranks	1870

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	0.016
Max	0.130	0.038
Min	0.005	-0.017
σ	0.030	0.017
$m-1.96*\sigma$	-0.008	-0.018
$m+1.96*\sigma$	0.109	0.049

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1		0.030	0.030	R	21	21
2		0.010	0.010	R	6.5	6.5
3		0.045	0.045	R	38.5	38.5
4		0.045	0.045	R	38.5	38.5
5		0.050	0.050	R	48	48
6		0.040	0.040	R	30	30
7		0.035	0.035	R	25.5	25.5
8		0.050	0.050	R	48	48
9		0.050	0.050	R	48	48
10		0.130	0.130	R	62.5	62.5
11		0.120	0.120	R	61	61
12		0.040	0.040	R	30	30
13		0.045	0.045	R	38.5	38.5
14		0.130	0.130	R	62.5	62.5
15		0.050	0.050	R	48	48
16		0.088	0.088	R	56	56
17		0.080	0.080	R	53	53
18		0.100	0.100	R	60	60
19		0.069	0.069	R	52	52
20		0.097	0.097	R	58	58

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
21		0.084	0.084	R	55	55
22		0.098	0.098	R	59	59
23		0.045	0.045	R	38.5	38.5
24		0.045	0.045	R	38.5	38.5
25		0.020	0.020	R	13	13
26		0.045	0.045	R	38.5	38.5
27		0.089	0.089	R	57	57
28		0.050	0.050	R	48	48
29		0.045	0.045	R	38.5	38.5
30		0.050	0.050	R	48	48
31		0.045	0.045	R	38.5	38.5
32		0.040	0.040	R	30	30
33		0.045	0.045	R	38.5	38.5
34		0.045	0.045	R	38.5	38.5
35		0.045	0.045	R	38.5	38.5
36		0.025	0.025	R	17.5	17.5
37		0.082	0.082	R	54	54
38		0.045	0.045	R	38.5	38.5
39		0.040	0.040	R	30	30
40		0.035	0.035	R	25.5	25.5
41		0.025	0.025	R	17.5	17.5
42		0.005	0.005	R	5	5
43		0.020	0.020	R	13	13
44		0.010	0.010	R	6.5	6.5
45		0.020	0.020	R	13	13
46		0.020	0.020	R	13	13
47		0.050	0.050	R	48	48
48		0.030	0.030	R	21	21
49		0.030	0.030	R	21	21
50		0.020	0.020	R	13	13
51		0.040	0.040	R	30	30
52	C1WC0001S001	0.002	0.002	S	4	0
53	C1WC0002S001	0.029	0.029	S	19	0
54	C1WC0003S001	-0.017	-0.017	S	1	0
55	C1WC0004S001	0.025	0.025	S	16	0
56	C1WC0005S001	0.031	0.031	S	23	0
57	C1WC0006S001	0.038	0.038	S	27	0
58	C1WC0007S001	0.015	0.015	S	8	0
59	C1WC0008S001	0.000	0.000	S	3	0
60	C1WC0009S001	-0.006	-0.006	S	2	0
61	C1WC0010S001	0.020	0.020	S	10	0
62	C1WC0011S001	0.017	0.017	S	9	0
63	C1WC0012S001	0.032	0.032	S	24	0
Sum					2016	1870

Soil Data from ISRA 009 - CTL-1

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	C1WC0001S001	N/A	4/27/2010	251899	0.0126	0.0184	0.0332	NDA	0.00238	0.0214	0.0423	NDA	-0.614	0.501	0.907	NDA
2	C1WC0002S001	N/A	4/27/2010	251899	0.0151	0.0244	0.0431	NDA	0.0291	0.0272	0.0438	NDA	-0.61	0.518	0.936	NDA
3	C1WC0003S001	N/A	4/27/2010	251899	-0.012	0.0271	0.0464	NDA	-0.0174	0.0167	0.0427	NDA	-0.633	0.526	0.952	NDA
4	C1WC0004S001	N/A	4/27/2010	251899	0.126	0.0373	0.0345		0.0247	0.0253	0.0416	NDA	-0.177	0.526	0.923	NDA
5	C1WC0005S001	N/A	4/27/2010	251899	0.0669	0.0407	0.0447		0.0307	0.0222	0.0336	NDA	-0.441	0.536	0.958	NDA
6	C1WC0006S001	N/A	4/27/2010	251899	0.000307	0.0181	0.0318	NDA	0.0384	0.0277	0.0421	NDA	-0.462	0.518	0.926	NDA
7	C1WC0007S001	N/A	4/28/2010	251961	0.00436	0.0276	0.0478	NDA	0.0154	0.0239	0.0418	NDA	-0.635	0.507	0.92	NDA
8	C1WC0008S001	N/A	4/28/2010	251961	0.0108	0.0238	0.0423	NDA	0.000206	0.0207	0.0405	NDA	-0.533	0.809	1.44	NDA
9	C1WC0009S001	N/A	4/27/2010	251899	0.0333	0.0287	0.0351	NDA	-0.00579	0.0206	0.0419	NDA	-0.812	0.633	1.13	NDA
10	C1WC0010S001	N/A	4/27/2010	251899	0.00592	0.0155	0.0281	NDA	0.0196	0.0236	0.0399	NDA	-0.337	0.64	1.12	NDA
11	C1WC0011S001	N/A	6/17/2010	255148	0.215	0.0447	0.0431		0.0167	0.0269	0.0466	NDA	0.318	0.376	0.633	NDA
12	C1WC0012S001	N/A	6/17/2010	255148	0.27	0.0572	0.037		0.0321	0.0261	0.0426	NDA	0.0348	0.354	0.641	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	0.062		0.039		0.016		0.042		-0.408		0.957	
Maximum	0.270		0.048		0.038		0.047		0.318		1.440	
Minimum	-0.012		0.028		-0.017		0.034		-0.812		0.633	
Count				12				12				12
Number of Non-Detects				8				12				12
% Non-Detects				67%				100%				100%

Appendix 2
Radionuclide Results

ISRA Outfall 009 - CTLI-1

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
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Americium-241	-0.0167	0.0997	0.184	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Americium-241	-0.287	0.119	0.196	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Americium-241	-0.189	0.187	0.328	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Americium-241	0.0345	0.0835	0.14	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Americium-241	-0.259	0.13	0.225	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Americium-241	-0.0418	0.0961	0.175	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Americium-241	0.019	0.0266	0.045	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Americium-241	0.0306	0.118	0.22	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Americium-241	0.0186	0.0591	0.102	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Americium-241	-0.0199	0.086	0.166	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Americium-241	0.119	0.113	0.196	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Americium-241	0.0385	0.0675	0.113	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Cesium-134	0	0.0426	0.0483	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Cesium-134	0	0.0292	0.0579	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Cesium-134	0	0.0521	0.0666	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Cesium-134	0	0.0403	0.0516	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Cesium-134	0	0.0424	0.0627	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Cesium-134	0	0.0317	0.0457	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Cesium-134	0	0.0367	0.053	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Cesium-134	0.0553	0.0421	0.0566	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Cesium-134	0	0.035	0.0511	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Cesium-134	0	0.0318	0.0423	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Cesium-134	0	0.0428	0.0612	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Cesium-134	0	0.0303	0.0569	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Cesium-137	0.0126	0.0184	0.0332	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Cesium-137	0.0151	0.0244	0.0431	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Cesium-137	-0.012	0.0271	0.0464	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Cesium-137	0.126	0.0373	0.0345	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Cesium-137	0.0669	0.0407	0.0447	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Cesium-137	0.000307	0.0181	0.0318	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Cesium-137	0.00436	0.0276	0.0478	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Cesium-137	0.0108	0.0238	0.0423	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Cesium-137	0.0333	0.0287	0.0351	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Cesium-137	0.00592	0.0155	0.0281	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Cesium-137	0.215	0.0447	0.0431	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Cesium-137	0.27	0.0572	0.037	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Cobalt-60	-0.0254	0.0202	0.0308	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Cobalt-60	0.0321	0.0253	0.0469	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Cobalt-60	-0.00696	0.0282	0.0457	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Cobalt-60	0.00486	0.0197	0.0339	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Cobalt-60	-0.0159	0.0254	0.0402	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Cobalt-60	0.00738	0.0179	0.0309	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Cobalt-60	-0.000958	0.0248	0.0418	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Cobalt-60	-0.00821	0.0231	0.0379	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Cobalt-60	0.0106	0.0199	0.0355	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Cobalt-60	-0.00286	0.0157	0.0263	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Cobalt-60	-0.0137	0.0246	0.0394	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Cobalt-60	0.0246	0.0235	0.0431	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Europium-152	-0.0259	0.0514	0.0785	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Europium-152	-0.0371	0.0636	0.1	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Europium-152	-0.0299	0.089	0.125	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Europium-152	-0.0379	0.076	0.0885	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Europium-152	-0.0515	0.0671	0.11	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Europium-152	0.0108	0.0545	0.0815	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Europium-152	-0.025	0.051	0.0866	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Europium-152	-0.0675	0.0758	0.101	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Europium-152	0.0142	0.057	0.0903	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Europium-152	-0.024	0.0522	0.0719	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Europium-152	-0.000634	0.0711	0.11	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Europium-152	-0.0179	0.0615	0.0976	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Europium-154	-0.0661	0.064	0.101	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Europium-154	-0.064	0.0812	0.124	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1														

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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
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Europium-154	-0.0277	0.0652	0.109	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Europium-154	-0.0829	0.0871	0.133	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Europium-154	-0.0166	0.0638	0.106	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Europium-154	0.0468	0.0762	0.135	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Europium-154	-0.0183	0.0756	0.126	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Europium-154	-0.0177	0.0663	0.112	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Europium-154	-0.0231	0.0553	0.0925	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Europium-154	-0.0126	0.0777	0.13	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Europium-154	-0.0344	0.0779	0.129	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Manganese-54	-0.000363	0.0191	0.0327	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Manganese-54	0.0119	0.023	0.0413	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Manganese-54	-0.00179	0.0262	0.045	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Manganese-54	0.0301	0.0216	0.0345	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Manganese-54	0.00421	0.0243	0.0431	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Manganese-54	-0.00114	0.0193	0.0328	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Manganese-54	0.0196	0.0221	0.0397	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Manganese-54	-0.000357	0.023	0.0391	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Manganese-54	0.0121	0.0205	0.0365	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Manganese-54	0.00646	0.0163	0.0289	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Manganese-54	0.000603	0.0247	0.0422	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Manganese-54	-0.0178	0.0233	0.0378	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Potassium-40	26.5	2.7	0.256	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Potassium-40	22.7	2.04	0.335	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Potassium-40	25	2.69	0.421	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Potassium-40	24.4	2.35	0.289	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Potassium-40	21.5	1.94	0.342	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Potassium-40	25.6	2.62	0.253	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Potassium-40	24.9	2.32	0.303	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Potassium-40	24.8	2.48	0.301	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Potassium-40	23.3	2.19	0.319	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste	
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Potassium-40	23.5	2.38	0.224	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste	
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Potassium-40	23.4	2.41	0.352	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste	
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Potassium-40	22.7	2.19	0.353	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Sodium-22	-0.0227	0.0224	0.0355	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Sodium-22	-0.022	0.0285	0.0436	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Sodium-22	0.00272	0.0336	0.0563	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Sodium-22	-0.00922	0.0229	0.0383	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Sodium-22	-0.0286	0.0305	0.0467	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Sodium-22	-0.00557	0.0224	0.0372	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Sodium-22	0.0164	0.0267	0.0473	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Sodium-22	-0.00524	0.0266	0.0446	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Sodium-22	-0.0123	0.0236	0.0391	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Sodium-22	-0.00833	0.0194	0.0325	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Sodium-22	-0.00638	0.0273	0.0456	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Sodium-22	-0.00754	0.027	0.0451	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Strontium-90	0.00238	0.0214	0.0423	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Strontium-90	0.0291	0.0272	0.0438	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Strontium-90	-0.0174	0.0167	0.0427	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Strontium-90	0.0247	0.0253	0.0416	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Strontium-90	0.0307	0.0222	0.0336	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Strontium-90	0.0384	0.0277	0.0421	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Strontium-90	0.0154	0.0239	0.0418	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Strontium-90	0.000206	0.0207	0.0405	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Strontium-90	-0.00579	0.0206	0.0419	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Strontium-90	0.0196	0.0236	0.0399	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Strontium-90	0.0167	0.0269	0.0466	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Strontium-90	0.0321	0.0261	0.0426	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Thorium-228	1.53	0.161	0.0496	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Thorium-228	1.1	0.101	0.0606	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Thorium-228	1.53	0.199	0.0746	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Thorium-228	1.87	0.252	0.0578	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Thorium-228	1.65	0.138	0.0665	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Thorium-228	1.27	0.14	0.061	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste	

ISRA Outfall 009 - CTLI-1

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
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Thorium-228	1.47	0.177	0.0499		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Thorium-228	1.49	0.173	0.0606		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Thorium-228	1.28	0.135	0.0529		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Thorium-228	1.43	0.149	0.0452		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Thorium-228	1.46	0.164	0.0641		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Thorium-228	1.5	0.157	0.0566		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Thorium-232	1.59	0.265	0.118		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Thorium-232	1.09	0.205	0.14		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Thorium-232	1.37	0.307	0.177		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Thorium-232	1.79	0.291	0.124		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Thorium-232	1.63	0.272	0.165		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Thorium-232	1.46	0.257	0.126		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Thorium-232	1.56	0.263	0.125		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Thorium-232	1.64	0.287	0.146		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Thorium-232	1.35	0.223	0.125		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Thorium-232	1.52	0.249	0.103		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Thorium-232	1.66	0.28	0.156		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Thorium-232	1.44	0.24	0.124		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Tritium	-0.614	0.501	0.907	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Tritium	-0.61	0.518	0.936	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Tritium	-0.633	0.526	0.952	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Tritium	-0.177	0.526	0.923	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Tritium	-0.441	0.536	0.958	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Tritium	-0.462	0.518	0.926	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Tritium	-0.635	0.507	0.92	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Tritium	-0.533	0.809	1.44	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Tritium	-0.812	0.633	1.13	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Tritium	-0.337	0.64	1.12	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Tritium	0.318	0.376	0.633	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Tritium	0.0348	0.354	0.641	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Uranium-235	-0.0235	0.114	0.193	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Uranium-235	0.135	0.127	0.218	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Uranium-235	0.137	0.167	0.274	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Uranium-235	-0.0186	0.123	0.214	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Uranium-235	0.0624	0.141	0.245	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Uranium-235	0.106	0.111	0.18	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Uranium-235	0.137	0.123	0.16	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Uranium-235	0.00924	0.127	0.226	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Uranium-235	0.0557	0.112	0.198	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Uranium-235	0.105	0.0977	0.172	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Uranium-235	0.116	0.134	0.232	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Uranium-235	0.111	0.126	0.218	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0001	C1WC0001S001	Soil	Uranium-238	0.736	0.915	1.64	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0002	C1WC0002S001	Soil	Uranium-238	1.43	0.97	1.78	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0003	C1WC0003S001	Soil	Uranium-238	1.88	1.52	2.67	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0004	C1WC0004S001	Soil	Uranium-238	1.35	1.15	1.21		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0005	C1WC0005S001	Soil	Uranium-238	0.687	1.05	1.96	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0006	C1WC0006S001	Soil	Uranium-238	0.768	0.891	1.59	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0007	C1WC0007S001	Soil	Uranium-238	1.22	0.549	0.44		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/27/2010	CTLI-1	C1WC0008	C1WC0008S001	Soil	Uranium-238	0.989	1.07	1.94	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251899	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0009	C1WC0009S001	Soil	Uranium-238	1.31	0.873	0.902		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	4/28/2010	CTLI-1	C1WC0010	C1WC0010S001	Soil	Uranium-238	0.579	0.778	1.47	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	251961	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0011	C1WC0011S001	Soil	Uranium-238	1.41	1.26	1.55	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste
2010 ISRA Waste Characterization	MWH	6/17/2010	CTLI-1B	C1WC0012	C1WC0012S001	Soil	Uranium-238	1.01	0.937	1.01		pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	255148	Waste

Outfall 009 Waste Characterization Sample Locations for CTLI-1A

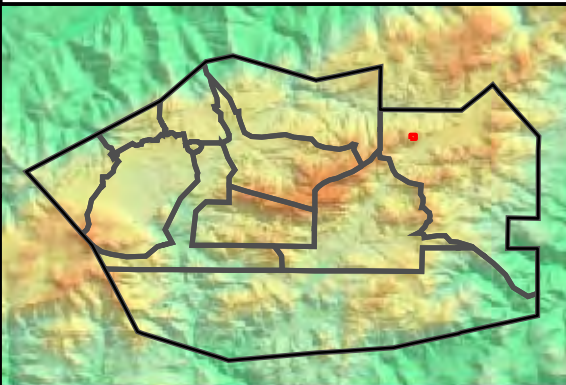
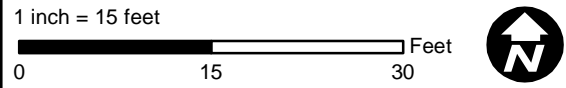
- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Base Map Legend**
- ISRA Excavation Boundary
 - Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_CTLI-1A_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



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

FIGURE 1

Outfall 009 Waste Characterization Sample Locations for CTLI-1B

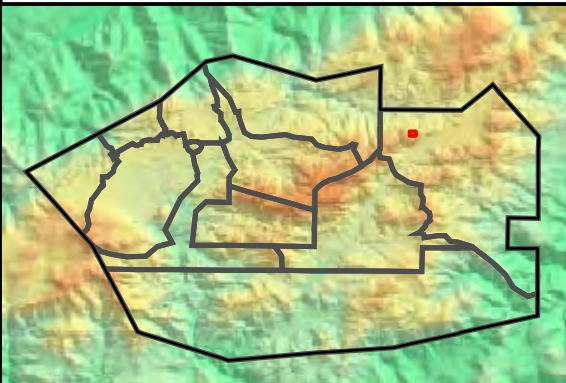
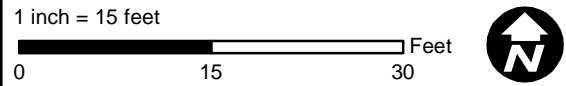
- Base Map Legend**
- Administrative Area Boundary
 - RFI Site Boundary
 - Report Group Boundary
 - NPDES Outfall
 - A/C Paving
 - Drainage
 - Non Jurisdictional Surface Water Pathway
 - Surface Water Divide
 - Elevation Contour

- Base Map Legend**
- ISRA Excavation Boundary
 - Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_CTLI-1B_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



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

FIGURE 1

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT ISRA OUTFALL 009 PLANNED EXCAVATION IEL-1

Introduction

This report presents supporting detailed information for the April 30, 2010 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area I, near the former Instrument Laboratory facility.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area I 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 I 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 guidelines presented in U.S. EPA SW-846 are followed in evaluating the adequacy of sampling and the application of analytical results to regulatory thresholds. 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. Statistical analyses described in SW-846 are performed as necessary to determine minimum sample point requirements and the upper confidence levels of analytical results.

The review of historical information and existing analytical data relevant to planned excavation IEL-1 was based partly on the Group 1A RFI results. Evaluation of these data and other sources of relevant information, including recent sampling conducted specifically for ISRA, suggested that Regulated Metals, Volatile Organic Compounds (VOC), Semi-Volatile Organic Compounds (SVOC), and Polychlorinated Biphenyls (PCB) should be addressed in the IEL-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 CAM 17 metals, VOCs, SVOCs, and PCBs. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the IEL-1 planned excavation area are presented in GEL Laboratories reports 252091 issued on 5/12/10 and 252782 issued on 5/19/10. Regulated Metals were below 10-Times their respective California Soluble Threshold Limits (STLC) in all cases, with the exception of one sample that exhibited Arsenic at 59 parts per million (ppm). This is slightly above the 50 ppm 10X STLC threshold. The Arsenic concentrations in the other 3 samples were 12.1 ppm, 17.5 ppm, and 42.7 ppm. Subsequent analysis of the elevated sample, as required, by the California Waste Extraction Test (WET) for leaching properties resulted in a

concentration of 0.119 milligrams per liter (mg/L). This is well below the 5 mg/L STLC hazardous waste limit. Nevertheless, considering that one other sample, with an Arsenic concentration of 42.7 ppm, approached the regulatory threshold, further evaluation was undertaken. In this case, two other samples had been collected and analyzed in the excavation footprint at an earlier time prior to waste characterization efforts. Analytical results for these samples exhibited an Arsenic concentration of 16.9 ppm and also a detection of Arsenic, but one that was below the Practical Quantitation Limit of 5 ppm. Even though these two sample results were not randomly derived, the STLC result for the elevated characterization sample already indicated the soil in the excavation footprint was non-hazardous for Arsenic. The additional samples provided further support for this determination.

Extremely low concentrations of two VOCs were detected, Styrene and Toluene. The Styrene concentrations ranged from non-detect at a Method Detection Limit (MDL) of 0.0003 ppm to a detected but estimated (i.e., "J-flagged") concentration of 0.0005 ppm. Similarly low concentrations of Toluene were detected ranging from non-detect at a MDL of 0.00032 ppm to 0.004 ppm. Concentrations of the detected VOCs at these levels are not significant with respect to hazardous waste regulations.

Some SVOCs were detected in the soil samples from IEL-1, none of which were above the parts per billion level. Specific hazardous waste thresholds have been established in the regulations for only a small number of SVOCs. There were no exceedances of established limits. Furthermore, none of the detected SVOCs exceeded U.S. EPA Region IX "Preliminary Remediation Goals" (PRG) values for residential soils. The MDLs of non-detected SVOCs were also below the PRG thresholds.

PCBs, in the form of Aroclors 1242, 1254, and 1260, were detected in two of the samples. In no case did any of the detected Aroclors exceed an individual concentration of 0.179 ppm. One sample contained a cumulative concentration of the 3 Aroclors at 0.411 ppm. Different Aroclors may contain some of the same PCB congeners, resulting in "double-counting" when simply adding Aroclor concentrations. However, even so, the result is far below the California 10X STLC and the federal Toxic Substances Control Act (TSCA) thresholds, which are both at 50 ppm.

Determination










According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area I IEL-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 if it is applied to 22 CCR 66261.24(a)(7)
 - 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 IEL-1 is NON-HAZARDOUS.

Outfall 009 Waste Characterization Sample Locations for IEL-1

Base Map Legend

-  Administrative Area Boundary
-  RFI Site Boundary
-  Report Group Boundary
-  NPDES Outfall
-  A/C Paving
-  Drainage
-  Non Jurisdictional Surface Water Pathway
-  Surface Water Divide
-  Elevation Contour

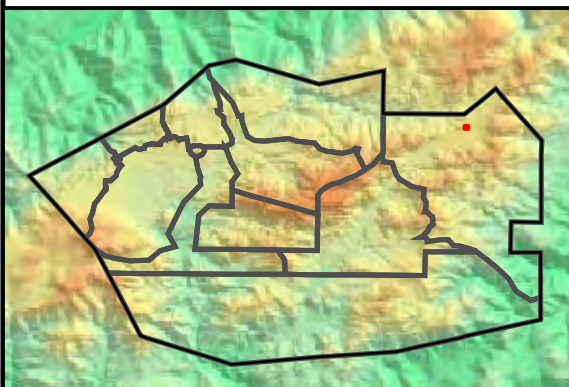
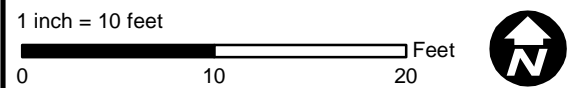
Base Map Legend

-  ISRA Excavation Boundary
-  Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_IEL-1_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – IEL-1
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

				<table border="1"> <tr> <td>Object Name:</td> <td>ILWC0001</td> <td>ILWC0002</td> <td>ILWC0003</td> <td>ILWC0004</td> </tr> <tr> <td>Sample Name:</td> <td>ILWC0001S001</td> <td>ILWC0002S001</td> <td>ILWC0003S001</td> <td>ILWC0004S001</td> </tr> <tr> <td>Collection Date:</td> <td>4/30/2010</td> <td>4/30/2010</td> <td>4/30/2010</td> <td>4/30/2010</td> </tr> <tr> <td>Sample Depth (feet):</td> <td>0.5 - 1.0</td> <td>0.0 - 0.5</td> <td>0.0 - 0.5</td> <td>0.25 - 0.75</td> </tr> </table>						Object Name:	ILWC0001	ILWC0002	ILWC0003	ILWC0004	Sample Name:	ILWC0001S001	ILWC0002S001	ILWC0003S001	ILWC0004S001	Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010	Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.25 - 0.75
Object Name:	ILWC0001	ILWC0002	ILWC0003	ILWC0004																									
Sample Name:	ILWC0001S001	ILWC0002S001	ILWC0003S001	ILWC0004S001																									
Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010																									
Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.25 - 0.75																									
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c																				
METALS																													
Antimony	mg/kg	500	150	--	--	0.143 J	0.183 J	0.107 J	0.158 J																				
Arsenic	mg/kg	500	50	100	--	59	42.7	17.5	12.1																				
Arsenic, WET	mg/L	--	--	--	5	0.119	--	--	--																				
Barium	mg/kg	10,000	1,000	2,000	--	61.5	55.4	75.4	82.3																				
Beryllium	mg/kg	75	7.5	--	--	0.669	0.896	0.554	0.469																				
Cadmium	mg/kg	100	10	20	--	0.0786 J	0.147	0.437	0.539																				
Chromium	mg/kg	500	50	100	--	27.2	26.9	23.5	29.9																				
Cobalt	mg/kg	8,000	800	--	--	7.98	7.19	6.47	7.86																				
Copper	mg/kg	2,500	250	--	--	11.4	11.5	35.5	32.3																				
Lead	mg/kg	1,000	50	100	--	4.27	4.17	10.9	19.4																				
Mercury	mg/kg	20	2	4	--	0.0217 J	0.0215 J	0.0713 J	0.0394 J																				
Molybdenum	mg/kg	3,500	3,500	--	--	0.704	0.633	0.866	0.883																				
Nickel	mg/kg	2,000	200	--	--	23.2	23.8	18.7	29.7																				
Selenium	mg/kg	100	10	20	--	0.182 J	0.0696 J	0.158 J	0.206 J																				
Silver	mg/kg	500	50	100	--	0.0346 J	<0.0092	0.113	0.108																				
Thallium	mg/kg	700	70	--	--	0.233	0.24	0.227	0.243																				
Vanadium	mg/kg	2,400	240	--	--	30	32.7	34.7	32.1																				
Zinc	mg/kg	5,000	2,500	--	--	55	47	84.2	95.6																				
General Chemistry																													
pH	SU					--	--	--	8.03 H																				
PCBs																													
Aroclor 1016	ug/kg	50,000	50,000	--	--	<3.32 {<1.11}	<3.32 {<1.11}	<16.6 {<5.54}	<3.33 {<1.11}																				
Aroclor 1221	ug/kg	50,000	50,000	--	--	<3.32 {<1.11}	<3.32 {<1.11}	<16.6 {<5.54}	<3.33 {<1.11}																				
Aroclor 1232	ug/kg	50,000	50,000	--	--	<3.32 {<1.11}	<3.32 {<1.11}	<16.6 {<5.54}	<3.33 {<1.11}																				
Aroclor 1242	ug/kg	50,000	50,000	--	--	<3.32 {<1.11}	<3.32 {<1.11}	179	<3.33 {<1.11}																				
Aroclor 1248	ug/kg	50,000	50,000	--	--	<3.32 {<1.11}	<3.32 {<1.11}	<16.6 {<5.54}	<3.33 {<1.11}																				
Aroclor 1254	ug/kg	50,000	50,000	--	--	<3.32 {<1.11}	<3.32 {<1.11}	160	<3.33 {<1.11}																				
Aroclor 1260	ug/kg	50,000	50,000	--	--	<3.32 {<1.11}	<3.32 {<1.11}	72	5																				
VOCs																													
1,1,1-Trichloroethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}																				
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}																				
1,1,2-Trichloro-1,2,2-trifluoroethane	ug/kg	--	--	--	--	<5.32 {<1.7}	<5.43 {<1.74}	<5.95 {<1.9}	<5.1 {<1.63}																				
1,1,2-Trichloroethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}																				
1,1-Dichloroethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}																				
1,1-Dichloroethene	ug/kg	--	--	14,000	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}																				

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – IEL-1
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	ILWC0001	ILWC0002	ILWC0003	ILWC0004
						Sample Name:	ILWC0001S001	ILWC0002S001	ILWC0003S001	ILWC0004S001
						Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.25 - 0.75
ANALYTE	UNITS	TTLC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
1,2-Dibromoethane (EDB)	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
1,2-Dichloroethane	ug/kg	--	--	10,000	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
1,2-Dichloropropane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
1,4-Dichlorobenzene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
2-Butanone (MEK)	ug/kg	--	--	4,000,000	--	<5.32 {<1.6}	<5.43 {<1.63}	<5.95 {<1.79}	<5.1 {<1.53}	
2-Hexanone	ug/kg	--	--	--	--	<5.32 {<1.6}	<5.43 {<1.63}	<5.95 {<1.79}	<5.1 {<1.53}	
Acetone	ug/kg	--	--	--	--	<5.32 {<1.77}	<5.43 {<1.8}	<5.95 {<1.98}	<5.1 {<1.69}	
Benzene	ug/kg	--	--	10,000	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Bromodichloromethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Bromoform	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Carbon Disulfide	ug/kg	--	--	--	--	<5.32 {<1.33}	<5.43 {<1.36}	<5.95 {<1.49}	<5.1 {<1.28}	
Carbon Tetrachloride	ug/kg	--	--	10,000	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Chlorobenzene	ug/kg	--	--	2,000,000	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Chloroethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Chloroform	ug/kg	--	--	120,000	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Chloromethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
cis-1,2-Dichloroethene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
cis-1,3-Dichloropropene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Cyclohexane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Dibromochloromethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Dichlorodifluoromethane	ug/kg	--	--	--	--	<1.06 {<0.362}	<1.09 {<0.37}	<1.19 {<0.405}	<1.02 {<0.347}	
Ethylbenzene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Hexachlorobutadiene	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Isopropylbenzene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
m,p-Xylenes	ug/kg	--	--	--	--	<2.13 {<0.319}	<2.17 {<0.326}	<2.38 {<0.357}	<2.04 {<0.306}	
Methyl acetate	ug/kg	--	--	--	--	<5.32 {<1.77}	<5.43 {<1.8}	<5.95 {<1.98}	<5.1 {<1.69}	
Methyl isobutyl ketone (MIBK)	ug/kg	--	--	--	--	<5.32 {<1.33}	<5.43 {<1.36}	<5.95 {<1.49}	<5.1 {<1.28}	
Methylcyclohexane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Methylene chloride	ug/kg	--	--	--	--	<5.32 {<2.13}	<5.43 {<2.17}	<5.95 {<2.38}	<5.1 {<2.04}	
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
o-Xylene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Styrene	ug/kg	--	--	--	--	0.351 J	0.37 J	0.512 J	<1.02 {<0.306}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – IEL-1
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	ILWC0001	ILWC0002	ILWC0003	ILWC0004
						Sample Name:	ILWC0001S001	ILWC0002S001	ILWC0003S001	ILWC0004S001
						Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.25 - 0.75
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Tetrachloroethene	ug/kg	--	--	14,000	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Tetrahydrofuran	ug/kg	--	--	--	--	<5.32 {<1.81}	<5.43 {<1.85}	<5.95 {<2.02}	<5.1 {<1.73}	
Toluene	ug/kg	--	--	--	--	<1.06 {<0.319}	2	4	0.694 J	
trans-1,2-Dichloroethene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
trans-1,3-Dichloropropene	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	--	<1.06 {<0.351}	<1.09 {<0.359}	<1.19 {<0.393}	<1.02 {<0.337}	
Trichlorofluoromethane	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Vinyl acetate	ug/kg	--	--	--	--	<5.32 {<1.33}	<5.43 {<1.36}	<5.95 {<1.49}	<5.1 {<1.28}	
Vinyl chloride	ug/kg	--	--	4,000	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
Xylenes, Total	ug/kg	--	--	--	--	<1.06 {<0.319}	<1.09 {<0.326}	<1.19 {<0.357}	<1.02 {<0.306}	
SVOCs										
1,1'-Biphenyl	ug/kg	--	--	--	--	<333 {<99.9}	<333 {<99.8}	<332 {<99.7}	<333 {<99.9}	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
1,4-Dichlorobenzene	ug/kg	--	--	150,000	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
1-Naphthylamine	ug/kg	--	--	--	--	<333 {<99.9}	<333 {<99.8}	<332 {<99.7}	<333 {<99.9}	
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
2,4-Dichlorophenol	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
2,4-Dimethylphenol	ug/kg	--	--	--	--	<333 {<117}	<333 {<116}	<332 {<116}	<333 {<117}	
2,4-Dinitrophenol	ug/kg	--	--	--	--	<666 {<126}	<666 {<126}	<665 {<126}	<666 {<127}	
2,4-Dinitrotoluene	ug/kg	--	--	2,600	--	<333 {<33.3}	<333 {<33.3}	<332 {<33.2}	<333 {<33.3}	
2,6-Dinitrotoluene	ug/kg	--	--	--	--	<333 {<33.3}	<333 {<33.3}	<332 {<33.2}	<333 {<33.3}	
2-Chloronaphthalene	ug/kg	--	--	--	--	<33.3 {<11}	<33.3 {<11}	<33.2 {<11}	<33.3 {<11}	
2-Chlorophenol	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
2-Methylnaphthalene	ug/kg	--	--	--	--	<33.3 {<6.66}	<33.3 {<6.66}	<33.2 {<6.65}	<33.3 {<6.66}	
2-Methylphenol	ug/kg	--	--	200	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
2-Naphthylamine	ug/kg	--	--	--	--	<333 {<110}	<333 {<110}	<332 {<110}	<333 {<110}	
2-Nitroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
2-Nitrophenol	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
3,3-Dichlorobenzidine	ug/kg	--	--	--	--	<333 {<99.9}	<333 {<99.8}	<332 {<99.7}	<333 {<99.9}	
3-Nitroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
4-Aminobiphenyl	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
4-Bromophenyl phenyl ether	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

WASTE CHARACTERIZATION SAMPLE RESULTS – IEL-1
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

						Object Name:	ILWC0001	ILWC0002	ILWC0003	ILWC0004
						Sample Name:	ILWC0001S001	ILWC0002S001	ILWC0003S001	ILWC0004S001
						Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.25 - 0.75
ANALYTE	UNITS	TTLIC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
4-Chloro-3-methylphenol	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
4-Chloroaniline	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
4-Chlorophenyl-phenylether	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
4-Methylphenol	ug/kg	--	--	200	--	<333 {<99.9}	<333 {<99.8}	<332 {<99.7}	<333 {<99.9}	
4-Nitroaniline	ug/kg	--	--	--	--	<333 {<99.9}	<333 {<99.8}	<332 {<99.7}	<333 {<99.9}	
4-Nitrophenol	ug/kg	--	--	--	--	<333 {<110}	<333 {<110}	<332 {<110}	<333 {<110}	
Acenaphthene	ug/kg	--	--	--	--	<33.3 {<11}	<33.3 {<11}	<33.2 {<11}	<33.3 {<11}	
Acenaphthylene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Acetophenone	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Anthracene	ug/kg	--	--	--	--	<33.3 {<6.66}	<33.3 {<6.66}	<33.2 {<6.65}	<33.3 {<6.66}	
Atrazine	ug/kg	--	--	--	--	<333 {<99.9}	<333 {<99.8}	<332 {<99.7}	<333 {<99.9}	
Benzaldehyde	ug/kg	--	--	--	--	<333 {<99.9}	<333 {<99.8}	<332 {<99.7}	<333 {<99.9}	
Benzidine	ug/kg	--	--	--	--	<333 {<99.9}	<333 {<99.8}	<332 {<99.7}	<333 {<99.9}	
Benzo(a)anthracene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Benzo(a)pyrene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	26.2 J	
Benzo(b)fluoranthene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	9.98 J	21.4 J	
Benzo(ghi)perylene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Benzo(k)fluoranthene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Bis(2-chloroethyl)ether	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
bis(2-Ethylhexyl) phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Butyl benzyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Caprolactam	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Carbazole	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Chrysene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	10.8 J	
Dibenzo(a,h)anthracene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Dibenzofuran	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Diethyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Dimethyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Di-n-butyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Di-n-octyl phthalate	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Diphenylamine	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Fluoranthene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	12.5 J	
Fluorene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Hexachlorobenzene	ug/kg	--	--	2,600	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – IEL-1
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

						Object Name:	ILWC0001	ILWC0002	ILWC0003	ILWC0004
						Sample Name:	ILWC0001S001	ILWC0002S001	ILWC0003S001	ILWC0004S001
						Collection Date:	4/30/2010	4/30/2010	4/30/2010	4/30/2010
						Sample Depth (feet):	0.5 - 1.0	0.0 - 0.5	0.0 - 0.5	0.25 - 0.75
ANALYTE	UNITS	TTLC	WET Leachate Testing Trigger ^a	TCLP Leachate Testing Trigger ^b	STLC	RESULT ^c	RESULT ^c	RESULT ^c	RESULT ^c	
Hexachlorobutadiene	ug/kg	--	--	10,000	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Hexachlorocyclopentadiene	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Hexachloroethane	ug/kg	--	--	60,000	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Isophorone	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Naphthalene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Nitrobenzene	ug/kg	--	--	40,000	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
n-Nitrosodimethylamine	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
n-Nitroso-di-n-propylamine	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
p-(Dimethylamino)azobenzene	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	--	<333 {<83.2}	<333 {<83.2}	<332 {<83.1}	<333 {<83.3}	
Phenanthrene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	<33.3 {<9.99}	
Phenol	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	
Pyrene	ug/kg	--	--	--	--	<33.3 {<9.99}	<33.3 {<9.98}	<33.2 {<9.97}	12.9 J	
Pyridine	ug/kg	--	--	--	--	<333 {<66.6}	<333 {<66.6}	<332 {<66.5}	<333 {<66.6}	

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – IEL-1 and IEL-2
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

Notes:

"--" - not analyzed / not applicable

<5 - Analyte not detected at or above the stated method detection limit (metals) or analyte not detected at or above the stated reporting limit (organics)

{<1} - Analyte not detected at or above the stated method detection limit (organics)

^a - WET Leachate Testing Trigger = STLC limit * 10

^b - TCLP Leachate Testing Trigger = TCLP limit * 20

^c Waste characterization sample results not validated

H - Analytical holding time was exceeded.

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.

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 will be preparing a document that provides the radiological results and statistical analysis of these waste characterization samples.

SU - Standard Units

**ISRA 009 – IEL-1.
Soil Sampling for Radionuclides.
Results and Statistical Analysis.
Waste Certification.**

This data package provides the laboratory results and statistical analysis of the 4 samples taken at the ISRA Outfall 009, IEL-1 area. This analysis and data interpretation complies with the procedure approved by the California Department of Public Health¹.

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 ~0.032 pCi/g and ~0.038 pCi/g respectively. Minimum detectable activity for tritium averaged ~0.79 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.

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.

Conclusions

Cesium-137 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from IEL-1 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 0.03 pCi/g which is less than the highest background result of 0.21 pCi/g. The highest non-background subtracted Cs-137 result is equivalent to an effective dose of 0.021 mrem/y⁶.

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/>.

Strontium-90 - Based on the results of the statistical analysis of Appendix 1, soil to be excavated from IEL-1 does not exceed the local background for Sr-90, and indeed are all non-detect. The incremental dose from Sr-90 above background is therefore zero mrem/y. The highest Sr-90 result is 0.03 pCi/g which is non-detect and less than the highest background result of 0.13 pCi/g. The highest non-background subtracted, non-detect Sr-90 result is equivalent to an effective dose of 0.009 mrem/y⁶.

Tritium - All tritium results are non-detect, the average tritium result is -0.344 pCi/g and the highest tritium result is -0.132 pCi/g. The highest non-detected, 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 waste disposal facility. The waste requires no further radiological controls.

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 IEL-1 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 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.

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 8 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>

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*



Phil Rutherford
Manager, Health, Safety & Radiation Services

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)	0.00
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:	4
Z-value for Alpha	1.645
Critical Value	1479
Sum of Reference Ranks	1514

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	0.009
Max	0.213	0.030
Min	0.015	-0.003
σ	0.062	0.015
$m-1.96\sigma$	-0.035	-0.020
$m+1.96\sigma$	0.210	0.039

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
1		0.092	0.092	R	32	32
2		0.020	0.020	R	10	10
3		0.020	0.020	R	10	10
4		0.100	0.100	R	36.5	36.5
5		0.020	0.020	R	10	10
6		0.158	0.158	R	47.5	47.5
7		0.175	0.175	R	49	49
8		0.209	0.209	R	54	54
9		0.180	0.180	R	50	50
10		0.030	0.030	R	18	18
11		0.213	0.213	R	55	55
12		0.025	0.025	R	15	15
13		0.020	0.020	R	10	10
14		0.020	0.020	R	10	10
15		0.074	0.074	R	28	28
16		0.147	0.147	R	43	43
17		0.100	0.100	R	36.5	36.5

No.	Soil ID	Cs-137	Adjusted Cs-137	Area	Ranks	Reference Ranks
18		0.067	0.067	R	26.5	26.5
19		0.099	0.099	R	35	35
20		0.101	0.101	R	38	38
21		0.148	0.148	R	44	44
22		0.153	0.153	R	46	46
23		0.025	0.025	R	15	15
24		0.188	0.188	R	51	51
25		0.198	0.198	R	53	53
26		0.030	0.030	R	18	18
27		0.079	0.079	R	29	29
28		0.158	0.158	R	47.5	47.5
29		0.109	0.109	R	39	39
30		0.059	0.059	R	25	25
31		0.067	0.067	R	26.5	26.5
32		0.113	0.113	R	40	40
33		0.015	0.015	R	5	5
34		0.031	0.031	R	21	21
35		0.042	0.042	R	24	24
36		0.097	0.097	R	33.5	33.5
37		0.015	0.015	R	5	5
38		0.020	0.020	R	10	10
39		0.085	0.085	R	31	31
40		0.080	0.080	R	30	30
41		0.015	0.015	R	5	5
42		0.020	0.020	R	10	10
43		0.035	0.035	R	22.5	22.5
44		0.035	0.035	R	22.5	22.5
45		0.025	0.025	R	15	15
46		0.150	0.150	R	45	45
47		0.140	0.140	R	41.5	41.5
48		0.190	0.190	R	52	52
49		0.097	0.097	R	33.5	33.5
50		0.030	0.030	R	18	18
51		0.140	0.140	R	41.5	41.5
52	ILWC0001S001	-0.001	-0.001	S	2	0
53	ILWC0002S001	-0.003	-0.003	S	1	0
54	ILWC0003S001	0.011	0.011	S	3	0
55	ILWC0004S001	0.030	0.030	S	20	0
Sum					1540	1514

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, Ho, is: Survey sample concentrations exceed those in the background

The alternative hypothesis, Ha, 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)	0.00
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:	4
Z-value for Alpha	1.645
Critical Value	1479
Sum of Reference Ranks	1506

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	0.021
Max	0.130	0.030
Min	0.005	0.006
σ	0.030	0.011
$m-1.96*\sigma$	-0.008	0.000
$m+1.96*\sigma$	0.109	0.041

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
1		0.030	0.030	R	16	16
2		0.010	0.010	R	3.5	3.5
3		0.045	0.045	R	30.5	30.5
4		0.045	0.045	R	30.5	30.5
5		0.050	0.050	R	40	40
6		0.040	0.040	R	22	22
7		0.035	0.035	R	18.5	18.5
8		0.050	0.050	R	40	40
9		0.050	0.050	R	40	40
10		0.130	0.130	R	54.5	54.5
11		0.120	0.120	R	53	53
12		0.040	0.040	R	22	22
13		0.045	0.045	R	30.5	30.5
14		0.130	0.130	R	54.5	54.5
15		0.050	0.050	R	40	40
16		0.088	0.088	R	48	48
17		0.080	0.080	R	45	45
18		0.100	0.100	R	52	52
19		0.069	0.069	R	44	44
20		0.097	0.097	R	50	50

No.	Soil ID	Sr-90	Adjusted Sr-90	Area	Ranks	Reference Ranks
21		0.084	0.084	R	47	47
22		0.098	0.098	R	51	51
23		0.045	0.045	R	30.5	30.5
24		0.045	0.045	R	30.5	30.5
25		0.020	0.020	R	8	8
26		0.045	0.045	R	30.5	30.5
27		0.089	0.089	R	49	49
28		0.050	0.050	R	40	40
29		0.045	0.045	R	30.5	30.5
30		0.050	0.050	R	40	40
31		0.045	0.045	R	30.5	30.5
32		0.040	0.040	R	22	22
33		0.045	0.045	R	30.5	30.5
34		0.045	0.045	R	30.5	30.5
35		0.045	0.045	R	30.5	30.5
36		0.025	0.025	R	11.5	11.5
37		0.082	0.082	R	46	46
38		0.045	0.045	R	30.5	30.5
39		0.040	0.040	R	22	22
40		0.035	0.035	R	18.5	18.5
41		0.025	0.025	R	11.5	11.5
42		0.005	0.005	R	1	1
43		0.020	0.020	R	8	8
44		0.010	0.010	R	3.5	3.5
45		0.020	0.020	R	8	8
46		0.020	0.020	R	8	8
47		0.050	0.050	R	40	40
48		0.030	0.030	R	16	16
49		0.030	0.030	R	16	16
50		0.020	0.020	R	8	8
51		0.040	0.040	R	22	22
52	ILWC0001S001	0.027	0.027	S	13	0
53	ILWC0002S001	0.030	0.030	S	14	0
54	ILWC0003S001	0.019	0.019	S	5	0
55	ILWC0004S001	0.006	0.006	S	2	0
Sum					1540	1506

Soil Data from ISRA 009 - IEL-1

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	ILWC0001S001	N/A	4/30/2010	252092	-0.000656	0.018	0.0316	NDA	0.0272	0.0217	0.0333	NDA	-0.227	0.453	0.796	NDA
2	ILWC0002S001	N/A	4/30/2010	252092	-0.00295	0.0156	0.0272	NDA	0.0297	0.0258	0.0414	NDA	-0.132	0.453	0.792	NDA
3	ILWC0003S001	N/A	4/30/2010	252092	0.0109	0.0228	0.0394	NDA	0.0188	0.0235	0.0399	NDA	-0.389	0.448	0.798	NDA
4	ILWC0004S001	N/A	4/30/2010	252092	0.0301	0.0212	0.0279		0.00632	0.0203	0.0377	NDA	-0.628	0.434	0.788	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	0.009	0.032			0.021	0.038			-0.344		0.794	
Maximum	0.030	0.039			0.030	0.041			-0.132		0.798	
Minimum	-0.003	0.027			0.006	0.033			-0.628		0.788	
Count			4				4					4
Number of Non-Detects			3				4					4
% Non-Detects			75%				100%					100%










Appendix 2
Radionuclide Results

ISRA Outfall 009 - IEL-1



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
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Americium-241	-0.0884	0.0796	0.142	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Americium-241	-0.119	0.0954	0.172	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Americium-241	0.019	0.0289	0.05	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Americium-241	0.0516	0.0478	0.0844	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Cesium-134	0	0.0399	0.0492	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Cesium-134	0	0.0265	0.0399	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Cesium-134	0	0.0324	0.055	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Cesium-134	0	0.0251	0.0366	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Cesium-137	-0.006656	0.018	0.0316	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Cesium-137	-0.00295	0.0156	0.0272	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Cesium-137	0.0109	0.0228	0.0394	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Cesium-137	0.0301	0.0212	0.0279	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Cobalt-60	-0.00878	0.0188	0.0313	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Cobalt-60	0.000758	0.0177	0.0304	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Cobalt-60	-0.00617	0.0212	0.0357	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Cobalt-60	0.00829	0.0145	0.0253	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Europium-152	-0.00187	0.0584	0.0838	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Europium-152	-0.0231	0.0448	0.0716	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Europium-152	-0.0101	0.0491	0.0804	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Europium-152	-0.0312	0.0427	0.0606	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Europium-154	-0.0259	0.0573	0.0901	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Europium-154	-0.00441	0.0547	0.0938	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Europium-154	-0.00316	0.0729	0.121	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Europium-154	0.00921	0.0485	0.0826	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Manganese-54	0.0122	0.0195	0.0346	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Manganese-54	-0.00292	0.0165	0.0281	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Manganese-54	0.0354	0.0301	0.0373	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Manganese-54	0.0229	0.0171	0.0242	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Potassium-40	17.4	1.71	0.294	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Potassium-40	20.1	2.03	0.228	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Potassium-40	19.2	1.91	0.278	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Potassium-40	21.3	1.94	0.184	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Sodium-22	-0.00853	0.0201	0.0318	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Sodium-22	0.000322	0.0192	0.0331	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Sodium-22	0.000263	0.0255	0.0424	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Sodium-22	0.00102	0.0171	0.0289	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Strontium-90	0.0272	0.0217	0.0333	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Strontium-90	0.0297	0.0258	0.0414	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Strontium-90	0.0188	0.0235	0.0399	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Strontium-90	0.00632	0.0203	0.0377	NDA	pCi/g	2 sigma	EPA 905.0 Modified	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Thorium-228	1.57	0.168	0.0495	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Thorium-228	1.2	0.136	0.0411	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Thorium-228	1.23	0.136	0.0444	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Thorium-228	1.31	0.145	0.0378	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Thorium-232	1.55	0.238	0.114	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Thorium-232	1.21	0.213	0.101	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Thorium-232	1.25	0.232	0.131	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Thorium-232	1.35	0.211	0.0813	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Tritium	-0.227	0.453	0.796	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Tritium	-0.132	0.453	0.792	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Tritium	-0.389	0.448	0.798	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Tritium	-0.628	0.434	0.788	NDA	pCi/g	2 sigma	EPA 906.0 Modified	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Uranium-235	0.0234	0.106	0.182	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Uranium-235	0.0393	0.0928	0.154	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Uranium-235	0.15	0.137	0.164	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Uranium-235	0.0694	0.0828	0.145	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0001	ILWC0001S001	Soil	Uranium-238	0.973	0.758	1.34	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0002	ILWC0002S001	Soil	Uranium-238	0.765	0.839	1.47	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0003	ILWC0003S001	Soil	Uranium-238	1.43	0.555	0.5	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste
2010 ISRA Waste Characterization	MWH	4/30/2010	IEL-1	ILWC0004	ILWC0004S001	Soil	Uranium-238	0.993	0.598	0.76	NDA	pCi/g	2 sigma	DOE HASL 300, 4.5.2.3/Ga-01-R	GEL	252092	Waste

Outfall 009 Waste Characterization Sample Locations for IEL-1

Base Map Legend

-  Administrative Area Boundary
-  RFI Site Boundary
-  Report Group Boundary
-  NPDES Outfall
-  A/C Paving
-  Drainage
-  Non Jurisdictional Surface Water Pathway
-  Surface Water Divide
-  Elevation Contour

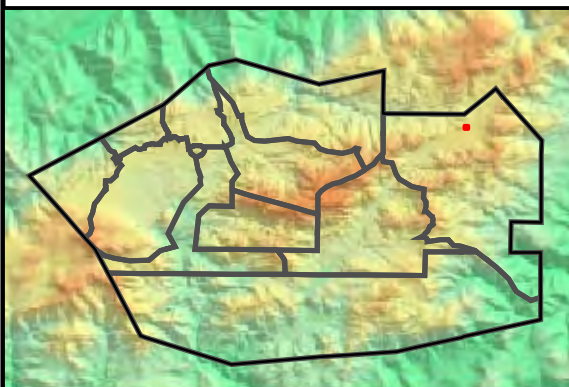
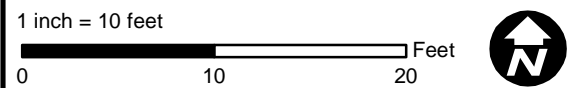
Base Map Legend

-  ISRA Excavation Boundary
-  Waste Characterization Sample Location

Note:

1. Sample locations and depths were randomly selected. The 3ft x 3ft grid used in the sample location selection process is shown.
2. Aerial imagery from Google Earth, 2010.
3. Topographic contours from Lidar data, 2008.

Document: ISRA_Plots_SP_IEL-1_SampleLocations_062110_WC.mxd Date: Jun 21, 2010



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

FIGURE 1