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

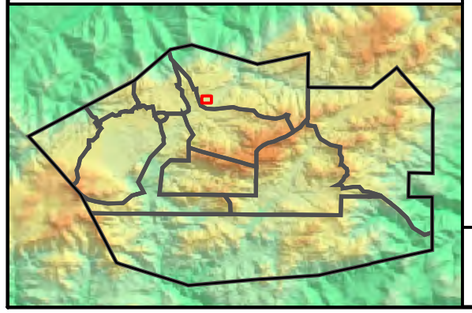
▲ Waste Characterization Sample

Document: ISRA_Plots_SP_RD47_SampleLocations_060710.mxd

Date: Jun 22, 2010

1 inch = 30 feet

0 30 60 Feet



MWH

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}

WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1A
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			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]
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

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ANALYTE	**UNITS**	**TTLC**	**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

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WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP
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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