WASTE CHARACTERIZATION: FURTHER SOIL EXCAVATION AT
ISRA HAPPY VALLEY HVS-2B-1 (CONTAINERIZED)

Introduction

This report presents supporting detailed information for characterization of additional soil excavated September 15, 2009 from the bottom of the original ISRA HVS-2B-1 site in Happy Valley.

Background

In-situ characterization of soil destined to be excavated from Happy Valley 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 Happy Valley (HV). The objective was to identify all substances that could have an impact on the determination of whether soil in each planned excavation footprint was hazardous or not.

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

The review of historical information and existing analytical data relevant to planned excavation HVS-2B, which was later divided into two separate areas identified as HVS-2B-1 and HVS-2B-2, was based largely on the Group 1A RFI results. No major concerns with respect to hazardous waste characterization were revealed by the review, but it did suggest that any further analysis should focus on regulated metals. To obtain additional data relating to regulated metals, a random sampling plan was developed for collection of eight (8) samples from the planned excavation footprint. However, changes were made in the excavation plans after sampling was already completed. The original area was divided into two separate areas and an additional 2 samples were collected to account for the new excavation footprint of HVS-2B-1. The samples were all analyzed for CAM 17 metals. All samples were collected, contained, and handled according to field practice requirements in SW-846.

The analytical results from the 2 additional samples confirmed the non-hazardous character determined from the original round of sampling. These results are reported in TestAmerica report ISG2313, issued on 8/11/09. Chromium (ranging from 14 ppm to 28 ppm) and Lead (ranging from 3.6 ppm to 34 ppm) were most significant from a regulatory standpoint, but both were well below their respective RCRA and California hazardous waste thresholds. All other regulated metals were insignificant with regard to regulatory thresholds.

Further Excavation Performed

Routine confirmation samples were collected from the bottom of HVS-2B-1 following excavation. Analytical results for the HVS-2B-1 confirmation sampling are presented in GEL Laboratories report 236436, issued on 9/10/09. One of the samples exhibited elevated Copper, which is regulated by California, but not under RCRA, at 1,550 ppm. A slightly elevated concentration of Lead was also detected at 54.3 ppm. These results suggested a small pocket of Copper and Lead impacted soil in this area.

As a result of the elevated concentrations, California Waste Extraction Tests (WET) were ordered for the samples to determine the status of the impacted soil relative to California Soluble Threshold Limit Concentration (STLC) thresholds. Additionally, another sample was collected from the area and submitted for analysis of Semi-Volatile Compound (SVOC) concentrations.

To assure proper management of the soil while the WET laboratory analyses were being performed regardless of testing outcomes, the soil was excavated to bedrock and contained in approved hazardous waste containers.

Results

Analytical results for the HVS-2B-1 California WET analyses are presented in GEL Laboratories report 237085, issued on 9/18/09 and revised 8/11/09. The WET results for Lead ranged from 1.85 mg/L to 2.11 mg/L, well below the STLC limit of 5 mg/L for Lead. The WET results for Copper ranged from 13.2 mg/L to 13.8 mg/L, again well below the STLC limit of 25 mg/L.

The SVOC results indicated only trace concentrations of two analytes, Pyrene at 0.0108 ppm and Bis(2-Ethylhexyl)phthalate at 0.0837 ppm.

Determination

According to analytical results and generator knowledge, the containerized soil from further excavation at Happy Valley HVS-2B-1:

Is Not a Listed Waste (generator knowledge)
Is Not ignitable (generator knowledge)
Is Not corrosive (generator knowledge)
Is Not reactive (generator knowledge)
Is Not toxic (analytical results and generator knowledge)
- Is Not Extremely or Acutely Hazardous Waste
- Does Not exceed any RCRA or Title 22 thresholds
- Is Not subject to the Prop. 65 listing
- Is Not subject to Title 22 Appendix X list
- Is Not known by experience or testing to pose a hazard to human health or environment because of its carcinogenicity, acute toxicity, chronic toxicity, bio-accumulative properties, or persistence in the environment.

The containerized soil from HVS-2B-1 is NON-HAZARDOUS.

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 008

HVS-2B-1 (Containerized Soil) WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

			Object Name:			**HZET0300**	**HZET0300**	**ISWC0112**
			Sample Name:			HZET0300S001	HZET0300D001	ISWC0112S001
			Collection Date:			9/1/2009	9/1/2009	9/14/2009
			Sample Depth (feet)[a]:			3.5 - 4.0	3.5 - 4.0	--
ANALYTE	**UNITS**	**TTLC**	**WET Leachate Testing Trigger[b]**	**TCLP Leachate Testing Trigger[c]**	**STLC**	**RESULT**	**RESULT**	**RESULT**
METALS								
Copper	mg/kg	2,500	250	--	--	362	1,550	--
Copper, WET	mg/L	--	--	--	25	13.8	13.2	--
Lead	mg/kg	1,000	50	100	--	47.1	54.3	--
Lead, WET	mg/L	--	--	--	5	--	1.85	--
SVOCs								
1,2,4-Trichlorobenzene	µg/kg	--	--	--	--	--	--	<333
1,2-Dichlorobenzene	µg/kg	--	--	--	--	--	--	<333
1,2-Diphenylhydrazine/Azobenzene	µg/kg	--	--	--	--	--	--	<333
1,3-Dichlorobenzene	µg/kg	--	--	--	--	--	--	<333
1,4-Dichlorobenzene	µg/kg	--	--	150,000	--	--	--	<333
2,4,5-Trichlorophenol	µg/kg	--	--	8,000,000	--	--	--	<333
2,4,6-Trichlorophenol	µg/kg	--	--	40,000	--	--	--	<333
2,4-Dichlorophenol	µg/kg	--	--	--	--	--	--	<333
2,4-Dimethylphenol	µg/kg	--	--	--	--	--	--	<333
2,4-Dinitrophenol	µg/kg	--	--	--	--	--	--	<666
2,4-Dinitrotoluene	µg/kg	--	--	2,600	--	--	--	<333
2,6-Dinitrotoluene	µg/kg	--	--	--	--	--	--	<333
2-Chloronaphthalene	µg/kg	--	--	--	--	--	--	<33.3
2-Chlorophenol	µg/kg	--	--	--	--	--	--	<333
2-Methylnaphthalene	µg/kg	--	--	--	--	--	--	<33.3
2-Methylphenol	µg/kg	--	--	--	--	--	--	<333
2-Nitroaniline	µg/kg	--	--	--	--	--	--	<333
2-Nitrophenol	µg/kg	--	--	--	--	--	--	<333
3,3-Dichlorobenzidine	µg/kg	--	--	--	--	--	--	<333
3-Nitroaniline	µg/kg	--	--	--	--	--	--	<333
4,6-Dinitro-2-methylphenol	µg/kg	--	--	--	--	--	--	<333
4-Bromophenyl phenyl ether	µg/kg	--	--	--	--	--	--	<333
4-Chloro-3-methylphenol	µg/kg	--	--	--	--	--	--	<333
4-Chloroaniline	µg/kg	--	--	--	--	--	--	<333
4-Chlorophenyl-phenylether	µg/kg	--	--	--	--	--	--	<333
4-Methylphenol	µg/kg	--	--	--	--	--	--	<333
4-Nitroaniline	µg/kg	--	--	--	--	--	--	<333
4-Nitrophenol	µg/kg	--	--	--	--	--	--	<333
Acenaphthene	µg/kg	--	--	--	--	--	--	<33.3
Acenaphthylene	µg/kg	--	--	--	--	--	--	<33.3

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HVS-2B-1 (Containerized Soil) WASTE CHARACTERIZATION RESULTS
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ANALYTE	**UNITS**	**TTLC**	**WET Leachate Testing Trigger[b]**	**TCLP Leachate Testing Trigger[c]**	**STLC**	**RESULT**	**RESULT**	**RESULT**
Aniline	µg/kg	--	--	--	--	--	--	<333
Anthracene	µg/kg	--	--	--	--	--	--	<33.3
Benzidine	µg/kg	--	--	--	--	--	--	<333
Benzo(a)anthracene	µg/kg	--	--	--	--	--	--	<33.3
Benzo(a)pyrene	µg/kg	--	--	--	--	--	--	<33.3
Benzo(b)fluoranthene	µg/kg	--	--	--	--	--	--	<33.3
Benzo(ghi)perylene	µg/kg	--	--	--	--	--	--	<33.3
Benzo(k)fluoranthene	µg/kg	--	--	--	--	--	--	<33.3
Benzoic acid	µg/kg	--	--	--	--	--	--	<666
Benzyl alcohol	µg/kg	--	--	--	--	--	--	<333
Bis(2-chloroethoxy)methane	µg/kg	--	--	--	--	--	--	<333
Bis(2-chloroethyl)ether	µg/kg	--	--	--	--	--	--	<333
Bis(2-chloroisopropyl)ether	µg/kg	--	--	--	--	--	--	<333
bis(2-Ethylhexyl)phthalate	µg/kg	--	--	--	--	--	--	83.7 J
Butyl benzyl phthalate	µg/kg	--	--	--	--	--	--	<333
Chrysene	µg/kg	--	--	--	--	--	--	<33.3
Dibenzo(a,h)anthracene	µg/kg	--	--	--	--	--	--	<33.3
Dibenzofuran	µg/kg	--	--	--	--	--	--	<333
Diethylphthalate	µg/kg	--	--	--	--	--	--	<333
Dimethylphthalate	µg/kg	--	--	--	--	--	--	<333
Di-n-butylphthalate	µg/kg	--	--	--	--	--	--	<333
Di-n-octyl-phthalate	µg/kg	--	--	--	--	--	--	<333
Diphenylamine	µg/kg	--	--	--	--	--	--	<333
Fluoranthene	µg/kg	--	--	--	--	--	--	<33.3
Fluorene	µg/kg	--	--	--	--	--	--	<33.3
Hexachlorobenzene	µg/kg	--	--	2,600	--	--	--	<333
Hexachlorobutadiene	µg/kg	--	--	10,000	--	--	--	<333
Hexachlorocyclopentadiene	µg/kg	--	--	--	--	--	--	<333
Hexachloroethane	µg/kg	--	--	60,000	--	--	--	<333
Indeno(1,2,3-cd)pyrene	µg/kg	--	--	--	--	--	--	<33.3
Isophorone	µg/kg	--	--	--	--	--	--	<333
Naphthalene	µg/kg	--	--	--	--	--	--	<33.3
Nitrobenzene	µg/kg	--	--	40,000	--	--	--	<333
n-Nitrosodimethylamine	µg/kg	--	--	--	--	--	--	<333
n-Nitroso-di-n-propylamine	µg/kg	--	--	--	--	--	--	<333
Pentachlorophenol	µg/kg	17,000	17,000	2,000,000	--	--	--	<333

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ANALYTE	**UNITS**	**TTLC**	**WET Leachate Testing Trigger[b]**	**TCLP Leachate Testing Trigger[c]**	**STLC**	**RESULT**	**RESULT**	**RESULT**
Phenanthrene	µg/kg	--	--	--	--	--	--	<33.3
Phenol	µg/kg	--	--	--	--	--	--	<333
Pyrene	µg/kg	--	--	--	--	--	--	10.8 J
RADIONUCLIDES	--	--	--	--	--	R	R	R

NOTES
"--" - not applicable
[a] feet below pre-existing ground surface
[b] - WET Leachate Testing Trigger = STLC limit * 10
[c] - TCLP Leachate Testing Trigger = TCLP limit * 20
J - Result is estimated
mg/kg - milligrams per kilogram
mg/L - milligrams per liter
µg/kg - micrograms per kilogram
R - Radiological analysis includes gamma spectroscopy (Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238 and Am-241), strontium-90, and tritium. Boeing has prepared a document that provides the radiological results and statistical analysis of the Outfall 008 waste characterization samples. Based on the results, the document certifies the soil represented by these waste characterization samples to be "radiologically" acceptable for shipment to Class 1, 2, and/or 3 disposal facilities. The analysis and data interpretation complies with procedures approved by the California Department of Public Health.