

WASTE CHARACTERIZATION: STOCKPILED SOIL FROM HVS-2D, HVS-3, AND
EXCAVATION OF THE NATURAL GAS PIPELINE

Introduction

This report describes the waste characterization process and results pertaining to soil excavated during removal of what is believed to be an out-of-service natural gas pipeline and from designated ISRA locations in the SSFL Happy Valley.

Background

In-situ soil waste characterization was carried out at locations identified for excavation in the Happy Valley (Outfall 8) ISRA Workplan. A step-by-step approach was followed to accomplish characterization of the soil prior to excavation, including reviews of historical area usage and existing analytical data from past soil sampling, random sampling of each planned excavation footprint, and additional sampling as required for statistical integrity and ISRA project objective attainment confirmation. The results of all characterizations performed in Happy Valley prior to the present activity demonstrated that the excavated soils could be shipped off-site for disposal as non-hazardous waste. These determinations were based on 61 soil samples collected specifically for waste characterization and dozens of other samples analyzed during past soil survey and confirmation activities.

The present activity involves excavation and stockpiling of soil excavated from 3 non-contiguous ISRA locations in Happy Valley: HVS-2D, HVS-3, and the trench resulting from removal of an out-of-service natural gas pipeline.

HVS-2D

HVS-2D was located immediately adjacent to the original planned HVS-2A excavation footprint, which was subjected to in-situ sampling. Furthermore, HVS-2D was in close proximity to the revised HVS-2A excavation footprint (approximately 50 feet), where additional in-situ sampling was conducted to account for the change in planned excavation boundaries. For these reasons, waste characterization data from HVS-2A were also applicable to HVS-2D, and no additional in-situ sampling was conducted at this location.

Analytical results for the 15 samples collected in the original and revised HVS-2A planned excavation areas are presented in TestAmerica reports ISG0118, issued on 7/15/09; ISG2471, issued on 8/6/09; and ISG2313, issued on 8/11/09. All regulated metals were well below applicable regulatory thresholds. Chromium and Lead were most significant from a regulatory standpoint, but both were well below their respective RCRA and California hazardous waste thresholds. Chromium ranged from 9.7 ppm to 23 ppm compared to the TCLP 20 X threshold of 100 ppm, the CA TTLC threshold of 2,500 ppm, and the CA STLC 10 X threshold of 50 ppm. Similarly, Lead ranged 3.4 ppm to 33 ppm compared to the TCLP 20 X threshold of 100 ppm, the CA TTLC threshold of 1,000 ppm, and the CA STLC 10 X threshold of 50 ppm. Low concentrations of Selenium, a California only regulated metal, were also detected, ranging from ND to 1.5 ppm. The CA TTLC for Selenium is 100 ppm and the CA STLC 10 X threshold is 10 ppm. All other regulated metals are well below regulatory thresholds.

The soil in the area of HVS-2A was determined to be non-hazardous, and, consequently, so was the soil in HVS-2D. This determination was confirmed by a follow-up sample collected from

the bottom of the HVS-2D excavation. Lead in this sample was detected at a concentration of 4.63 ppm, which is far below applicable regulatory thresholds.

HVS-3

The review of historical information and existing analytical data relevant to planned excavation HVS-3 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. The samples were to be analyzed for CAM 17 metals. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Analytical results for the HVS-3 planned excavation area are presented in TestAmerica report ISG0120, issued on 7/15/09. All regulated metals were well below applicable regulatory thresholds. Cadmium, Chromium, and Lead were most significant from a regulatory standpoint, but all three were well below their respective RCRA and California hazardous waste thresholds. Cadmium ranged from ND to 1.8 ppm compared to the TCLP 20 X threshold of 20 ppm, the CA TTLC threshold of 100 ppm, and the CA STLC 10 X threshold of 10 ppm. Chromium ranged from 12 ppm to 16 ppm compared to the TCLP 20 X threshold of 100 ppm, the CA TTLC threshold of 2,500 ppm, and the CA STLC 10 X threshold of 50 ppm. Similarly, Lead ranged 8.9 ppm to 24 ppm compared to the TCLP 20 X threshold of 100 ppm, the CA TTLC threshold of 1,000 ppm, and the CA STLC 10 X threshold of 50 ppm. Copper, which is a California only regulated metal, was also detected at slightly elevated concentrations ranging between 6.8 ppm and 180 ppm compared to the CA TTLC threshold of 2,500 ppm and the CA STLC 10 X threshold of 250 ppm. All other regulated metals are well below regulatory thresholds supporting the determination that the soil in HVS-3 is non-hazardous.

Pipeline Trench

Like HVS-2D, the pipeline identified for removal was located in the general area of HVS-2A. The waste characterization results from HVS-2A are applicable to soil excavated during trenching for pipeline removal, and the trench soil was determined to be non-hazardous. Following removal of the pipeline, 3 confirmation samples were collected from the bottom of the trench and analyzed for asbestos and Polychlorinated Biphenyls (PCB). No asbestos was observed. However, very low concentrations of PCBs were detected in the samples at a maximum of 0.1 ppm. The trench was over-excavated in accordance with ISRA project objectives, but concentrations at these levels are not significant with respect to hazardous waste regulations.

Excavated Soil Stockpile

Upon excavation, soil from HVS-2D, HVS-3, and the pipeline removal trench were transported to an asphalt surfaced staging area and stockpiled. At the completion of excavation activities, the stockpile contained a total of approximately 50 cubic yards of soil.

A single sample was randomly collected from the stockpile itself. Analytical results are presented in TestAmerica report ISJ2591, issued on 11/16/09. No PCBs were detected in the sample. All detected regulated metals were at very low concentrations. Chromium and Lead were the most significant detections with respect to hazardous waste regulations. However, Chromium was detected at 15 ppm, compared with the RCRA 20X threshold of 100 ppm and

the California STLC WET threshold of 50 ppm. All other regulated metals exhibited an even greater divergence from applicable regulatory thresholds.

Determination

According to analytical results and generator knowledge, the soil in the stockpile containing material from Happy Valley HVS-2D, HVS-3, and the pipeline excavation trench:

Is Not a Listed Waste (generator knowledge)

Is Not ignitable (generator knowledge)

Is Not corrosive (generator knowledge)

Is Not reactive (generator knowledge)

Is Not characteristically 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 the 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, bioaccumulative properties, or persistence in the environment.

The soil in the stockpile containing soil from Happy Valley HVS-2D, HVS-3, and the pipeline excavation trench is NON-HAZARDOUS.

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 008

**HVS-2D, HVS-3, AND PIPELINE NEAR HVS-2A SOIL WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

| | | | Object Name: | | ISWC0113 |
|----------------------|--------------|--------------|---|--|-----------------|
| | | | Sample Name: | | ISWC0113S001 |
| | | | Collection Date: | | 10/22/2009 |
| | | | Sample Depth (feet): | | -- ^a |
| ANALYTE | UNITS | TTLIC | WET Leachate Testing Trigger^a | TCLP Leachate Testing Trigger^b | RESULT |
| METALS | | | | | |
| Antimony | mg/kg | 500 | 150 | -- | <0.88 |
| Arsenic | mg/kg | 500 | 50 | 100 | 6.9 |
| Barium | mg/kg | 10,000 | 1,000 | 2,000 | 57 |
| Beryllium | mg/kg | 75 | 7.5 | -- | 0.67 |
| Cadmium | mg/kg | 100 | 10 | 20 | 0.42 J |
| Chromium | mg/kg | 500 | 50 | 100 | 15 |
| Cobalt | mg/kg | 8,000 | 800 | -- | 6 |
| Copper | mg/kg | 2,500 | 250 | -- | 9.2 |
| Lead | mg/kg | 1,000 | 50 | 100 | 11 |
| Mercury | mg/kg | 20 | 2 | 4 | <0.012 |
| Molybdenum | mg/kg | 3,500 | 3,500 | -- | <0.20 |
| Nickel | mg/kg | 2,000 | 200 | -- | 9.4 |
| Selenium | mg/kg | 100 | 10 | 20 | <1.0 |
| Silver | mg/kg | 500 | 50 | 100 | <0.80 |
| Thallium | mg/kg | 700 | 70 | -- | <0.79 |
| Vanadium | mg/kg | 2,400 | 240 | -- | 26 |
| Zinc | mg/kg | 5,000 | 2,500 | -- | 40 |
| ASBESTOS | | | | | |
| Asbestos | % | 1% | -- | -- | <0.0003 |
| PCBs | | | | | |
| Aroclor 1016 | mg/kg | 50 | 50 | -- | <0.050 |
| Aroclor 1221 | mg/kg | 50 | 50 | -- | <0.050 |
| Aroclor 1232 | mg/kg | 50 | 50 | -- | <0.050 |
| Aroclor 1242 | mg/kg | 50 | 50 | -- | <0.050 |
| Aroclor 1248 | mg/kg | 50 | 50 | -- | <0.050 |
| Aroclor 1254 | mg/kg | 50 | 50 | -- | <0.050 |
| Aroclor 1260 | mg/kg | 50 | 50 | -- | <0.050 |
| RADIONUCLIDES | | | | | |
| | -- | -- | -- | -- | R |

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 008

HVS-2D, HVS-3, AND PIPELINE NEAR HVS-2A SOIL WASTE CHARACTERIZATION RESULTS THE BOEING COMPANY SANTA SUSANA FIELD LABORATORY

NOTES

Sample was randomly collected from a stockpile containing soil from HVS-2D, HVS-3, and from below the pipeline near HVS-2A

"--" - not applicable

^a - No sample depth because sample was collected from a stockpile

^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

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.