

WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT AREA II ISRA OUTFALL 009 PLANNED EXCAVATION AP/STP-1C-2-East

Introduction

This report presents supporting detailed information for the July 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 would be 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.

AP/STP-1C-2-East is part of a larger planned excavation footprint, AP/STP-1C-2. The footprint was subdivided into three (3) areas for sampling purposes: AP/STP-1C-2-East, AP/STP-1C-2-West, and AP/STP-1C-2-Main. In part, this was necessary because the irregular shape of the original footprint suggested the possibility of a characteristically heterogeneous wastestream. To address this potential issue, the significant protuberance on the east side of the main body of the planned excavation was identified as a separate area, with its own random sampling plan. This provided additional assurance that randomly identified sample collection points would not cluster in any particular area to the exclusion of other areas, which could void the representativeness of the collected samples. In addition to addressing sample collection point coverage, it was also necessary to accommodate potential changes in soil management strategy. Subsequent to initial waste characterization sampling, project management decided to retain the option of managing soil from a small portion on the western side of AP/STP-1C-2 separately from other soil contained in the excavation footprint. The original random samples provided data representative of the average properties of the entire AP/STP-1C-2-Main excavation footprint. However, when the west portion was separated from the main body, existing sampling data was no longer representative of the new area, identified as AP/STP-1C-2-West. To obtain the required representative waste characterization data, samples were collected from four new randomly identified collection points in the new area.

The review of historical information and existing analytical data relevant to planned excavation AP/STP-1C-2-East 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-1C-2-East 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-1C-2-East are presented in Test America reports ITG2664 issued on 8/6/10. Regulated Metals were below 10-Times their respective California Soluble Threshold Limit Concentration (STLC) threshold in all but one of the samples. In this sample an elevated concentration of lead was detected at 50 parts per million (ppm). As this equaled the 10X STLC threshold of 50 ppm, it was necessary to perform a California Waste Extraction Test (WET) to determine leaching characteristics. Lead was detected in the leachate at 0.86 milligrams per liter (mg/L), well below the STLC hazardous waste limit of 5 mg/L.

VOCs were detected, with Acetone observed in three samples exhibiting concentrations of 0.010 ppm, 0.020 ppm, and 0.022 ppm. The Acetone was not detected in any of the other samples, despite the satisfactorily low analytical Method Detection Limits (range 0.00043 ppm - 0.0091 ppm). Furthermore, no historical records have been found suggesting any kind of solvent related activities in the area with Acetone, and the very low concentrations detected in the samples are consistent with soil vapor migration, volatilization of a groundwater contaminant, or other manifestation of an unknown source. For these reasons, the soil excavated from AP/STP-1E-2 is not being characterized as "F-Listed" waste.

No PCBs were detected, but Petroleum Hydrocarbons were detected at low levels, with the concentration of C10-C40 fraction hydrocarbons ranging between 7.8 ppm and 16 ppm.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area II AP/STP-1C-2-East:

- 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-1C-2-East is NON-HAZARDOUS.

Outfall 009
Sample Locations for AP/STP - 1C,
AP/STP - 1B, and AP/STP - 1D

Base Map Legend











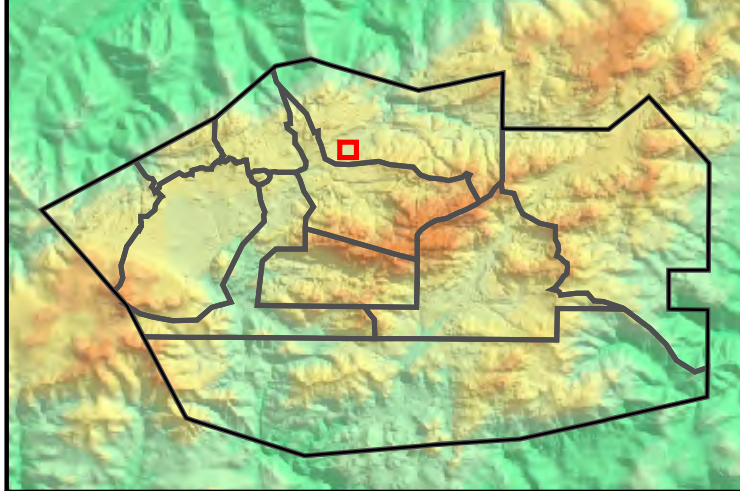
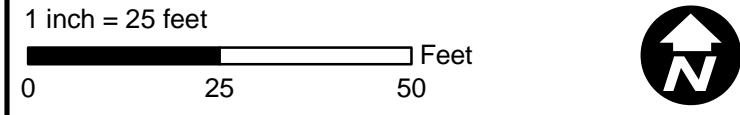
-  Administrative Area Boundary
-  RFI Site Boundary
-  Report Group Boundary
-  NPDES Outfall
-  A/C Paving
-  Drainage
-  Non Jurisdictional Surface Water Pathway
-  Surface Water Divide
-  Elevation Contour

Figure Legend

-  Waste Characterization Sample



Document: ISRA_Plots_Working_AP-STP-1C_SampleLocations.mxd Date: Sep 02, 2010



INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

**WASTE CHARACTERIZATION SAMPLE RESULTS – AP/STP-1C-2 (East)
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY**

			Object Name:			APWC0107	APWC0108	APWC0109	APWC0110
			Sample Name:			APWC0107S001	APWC0108S001	APWC0109S001	APWC0110S001
			Collection Date:			7/29/2010	7/29/2010	7/29/2010	7/29/2010
			Sample Depth (feet):			0.0 - 0.3	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
METALS									
Antimony	mg/kg	500	150	--	--	1 J	1.1 J	1.1 J	1.2 J
Arsenic	mg/kg	500	50	100	--	3.5	4.3	3.7	2.8
Barium	mg/kg	10,000	1,000	2,000	--	110	100	94	160
Beryllium	mg/kg	75	7.5	--	--	0.35 J	0.43 J	0.4 J	0.22 J
Cadmium	mg/kg	100	10	20	--	0.3 J	<0.20	2	1.3
Chromium	mg/kg	500	50	100	--	15	19	16	12
Cobalt	mg/kg	8,000	800	--	--	5.1	4.9	4.7	6.2
Copper	mg/kg	2,500	250	--	--	14	9.9	26	37
Lead	mg/kg	1,000	50	100	--	8.3	4.4	50	15
Lead, WET	mg/L	--	--	--	5	--	--	0.86	--
Mercury	mg/kg	20	2	4	--	<0.012	<0.012	0.012 J	0.016 J
Molybdenum	mg/kg	3,500	3,500	--	--	0.56 J	0.7 J	0.54 J	0.48 J
Nickel	mg/kg	2,000	200	--	--	10	12	11	9
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	2.7
Thallium	mg/kg	700	70	--	--	<0.79	<0.79	<0.79	<0.79
Vanadium	mg/kg	2,400	240	--	--	31	31	28	35
Zinc	mg/kg	5,000	2,500	--	--	85	53	660	220
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	--	--	--	--	<0.41 {<0.15}	<0.39 {<0.15}	<0.37 {<0.14}	<0.45 {<0.17}
EFH (C10 - C24)	mg/kg	--	--	--	--	<5 {<3.5}	<5 {<3.5}	<5 {<3.5}	4 J
EFH (C10 - C40)	mg/kg	--	--	--	--	15	7.8	9.4	16
EFH (C25 - C40)	mg/kg	--	--	--	--	13	4.7 J	7.3	12
VOCs									
1,1,1,2-Tetrachloroethane	ug/kg	--	--	--	--	<2 {<0.57}	<2 {<0.56}	<2 {<0.56}	<2 {<0.57}
1,1,1-Trichloroethane	ug/kg	--	--	--	--	<1 {<0.7}	<0.99 {<0.69}	<0.99 {<0.69}	<0.99 {<0.69}
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	--	<2 {<0.86}	<2 {<0.85}	<2 {<0.85}	<2 {<0.85}

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						Object Name:	APWC0107	APWC0108	APWC0109	APWC0110
						Sample Name:	APWC0107S001	APWC0108S001	APWC0109S001	APWC0110S001
						Collection Date:	7/29/2010	7/29/2010	7/29/2010	7/29/2010
						Sample Depth (feet):	0.0 - 0.3	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	
1,1,2-Trichloroethane	ug/kg	--	--	--	--	<1 {<0.87}	<0.99 {<0.86}	<0.99 {<0.86}	<0.99 {<0.86}	
1,1-Dichloroethane	ug/kg	--	--	--	--	<1 {<0.5}	<0.99 {<0.49}	<0.99 {<0.49}	<0.99 {<0.5}	
1,1-Dichloroethene	ug/kg	--	--	14,000	--	<2 {<0.6}	<2 {<0.59}	<2 {<0.59}	<2 {<0.6}	
1,1-Dichloropropene	ug/kg	--	--	--	--	<1 {<0.4}	<0.99 {<0.4}	<0.99 {<0.39}	<0.99 {<0.4}	
1,2,3-Trichlorobenzene	ug/kg	--	--	--	--	<2 {<1}	<2 {<0.99}	<2 {<0.99}	<2 {<0.99}	
1,2,3-Trichloropropane	ug/kg	--	--	--	--	<2 {<1}	<2 {<0.99}	<2 {<0.99}	<2 {<0.99}	
1,2,4-Trichlorobenzene	ug/kg	--	--	--	--	<2 {<1}	<2 {<0.99}	<2 {<0.99}	<2 {<0.99}	
1,2,4-Trimethylbenzene	ug/kg	--	--	--	--	<1 {<0.78}	<0.99 {<0.77}	<0.99 {<0.77}	<0.99 {<0.77}	
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	--	<10 {<1.5}	<9.9 {<1.5}	<9.9 {<1.5}	<9.9 {<1.5}	
1,2-Dibromoethane (EDB)	ug/kg	--	--	--	--	<1 {<0.8}	<0.99 {<0.79}	<0.99 {<0.79}	<0.99 {<0.79}	
1,2-Dichlorobenzene	ug/kg	--	--	--	--	<1 {<0.95}	<0.99 {<0.94}	<0.99 {<0.94}	<0.99 {<0.94}	
1,2-Dichloroethane	ug/kg	--	--	10,000	--	<1 {<0.8}	<0.99 {<0.79}	<0.99 {<0.79}	<0.99 {<0.79}	
1,2-Dichloropropane	ug/kg	--	--	--	--	<1 {<0.8}	<0.99 {<0.79}	<0.99 {<0.79}	<0.99 {<0.79}	
1,3,5-Trimethylbenzene	ug/kg	--	--	--	--	<1 {<0.63}	<0.99 {<0.62}	<0.99 {<0.62}	<0.99 {<0.62}	
1,3-Dichlorobenzene	ug/kg	--	--	--	--	<1 {<0.84}	<0.99 {<0.83}	<0.99 {<0.83}	<0.99 {<0.83}	
1,3-Dichloropropane	ug/kg	--	--	--	--	<1 {<0.63}	<0.99 {<0.62}	<0.99 {<0.62}	<0.99 {<0.62}	
1,4-Dichlorobenzene	ug/kg	--	--	--	--	<1 {<0.94}	<0.99 {<0.93}	<0.99 {<0.93}	<0.99 {<0.93}	
2,2-Dichloropropane	ug/kg	--	--	--	--	<1 {<0.6}	<0.99 {<0.59}	<0.99 {<0.59}	<0.99 {<0.6}	
2-Butanone (MEK)	ug/kg	--	--	4,000,000	--	<10 {<6}	<9.9 {<5.9}	<9.9 {<5.9}	<9.9 {<6}	
2-Chlorotoluene	ug/kg	--	--	--	--	<2 {<0.87}	<2 {<0.86}	<2 {<0.86}	<2 {<0.86}	
2-Hexanone	ug/kg	--	--	--	--	<10 {<9.1}	<9.9 {<9}	<9.9 {<9}	<9.9 {<9}	
4-Chlorotoluene	ug/kg	--	--	--	--	<2 {<0.74}	<2 {<0.73}	<2 {<0.73}	<2 {<0.73}	
4-Methyl-2-pentanone (MIBK)	ug/kg	--	--	--	--	<5 {<4.5}	<4.9 {<4.4}	<4.9 {<4.4}	<5 {<4.5}	
Acetone	ug/kg	--	--	--	--	22	<9.9 {<7.9}	20	10	
Benzene	ug/kg	--	--	10,000	--	<1 {<0.5}	<0.99 {<0.49}	<0.99 {<0.49}	<0.99 {<0.5}	
Bromobenzene	ug/kg	--	--	--	--	<2 {<0.84}	<2 {<0.83}	<2 {<0.83}	<2 {<0.83}	
Bromochloromethane	ug/kg	--	--	--	--	<2 {<0.9}	<2 {<0.89}	<2 {<0.89}	<2 {<0.89}	
Bromodichloromethane	ug/kg	--	--	--	--	<1 {<0.5}	<0.99 {<0.49}	<0.99 {<0.49}	<0.99 {<0.5}	
Bromoform	ug/kg	--	--	--	--	<2 {<0.8}	<2 {<0.79}	<2 {<0.79}	<2 {<0.79}	
Bromomethane	ug/kg	--	--	--	--	<2 {<0.92}	<2 {<0.91}	<2 {<0.91}	<2 {<0.91}	
Carbon Disulfide	ug/kg	--	--	--	--	<5 {<0.97}	<4.9 {<0.96}	<4.9 {<0.96}	<5 {<0.96}	
Carbon tetrachloride	ug/kg	--	--	10,000	--	<2 {<0.5}	<2 {<0.49}	<2 {<0.49}	<2 {<0.5}	
Chlorobenzene	ug/kg	--	--	2,000,000	--	<1 {<0.52}	<0.99 {<0.51}	<0.99 {<0.51}	<0.99 {<0.52}	
Chloroethane	ug/kg	--	--	--	--	<2 {<1.5}	<2 {<1.5}	<2 {<1.5}	<2 {<1.5}	
Chloroform	ug/kg	--	--	120,000	--	<1 {<0.5}	<0.99 {<0.49}	<0.99 {<0.49}	<0.99 {<0.5}	
Chloromethane	ug/kg	--	--	--	--	<2 {<1}	<2 {<0.99}	<2 {<0.99}	<2 {<0.99}	

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						Sample Depth (feet):	0.0 - 0.3	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	
cis-1,2-Dichloroethene	ug/kg	--	--	--	--	<1 {<0.83}	<0.99 {<0.82}	<0.99 {<0.82}	<0.99 {<0.82}	
cis-1,3-Dichloropropene	ug/kg	--	--	--	--	<1 {<0.44}	<0.99 {<0.43}	<0.99 {<0.43}	<0.99 {<0.44}	
Dibromochloromethane	ug/kg	--	--	--	--	<1 {<0.7}	<0.99 {<0.69}	<0.99 {<0.69}	<0.99 {<0.69}	
Dibromomethane	ug/kg	--	--	--	--	<1 {<0.9}	<0.99 {<0.89}	<0.99 {<0.89}	<0.99 {<0.89}	
Dichlorodifluoromethane	ug/kg	--	--	--	--	<5 {<1.5}	<4.9 {<1.5}	<4.9 {<1.5}	<5 {<1.5}	
Ethylbenzene	ug/kg	--	--	--	--	<1 {<0.5}	<0.99 {<0.49}	<0.99 {<0.49}	<0.99 {<0.5}	
Hexachlorobutadiene	ug/kg	--	--	--	--	<2 {<0.8}	<2 {<0.79}	<2 {<0.79}	<2 {<0.79}	
Isopropylbenzene	ug/kg	--	--	--	--	<1 {<0.54}	<0.99 {<0.53}	<0.99 {<0.53}	<0.99 {<0.54}	
m,p-Xylenes	ug/kg	--	--	--	--	<2 {<0.8}	<2 {<0.79}	<2 {<0.79}	<2 {<0.79}	
Methylene chloride	ug/kg	--	--	--	--	<10 {<6.5}	<9.9 {<6.4}	<9.9 {<6.4}	<9.9 {<6.4}	
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	--	<2 {<1}	<2 {<0.99}	<2 {<0.99}	<2 {<0.99}	
n-Butylbenzene	ug/kg	--	--	--	--	<2 {<0.72}	<2 {<0.71}	<2 {<0.71}	<2 {<0.71}	
n-Propylbenzene	ug/kg	--	--	--	--	<1 {<0.61}	<0.99 {<0.6}	<0.99 {<0.6}	<0.99 {<0.61}	
Naphthalene	ug/kg	--	--	--	--	<2 {<1.1}	<2 {<1.1}	<2 {<1.1}	<2 {<1.1}	
o-Xylene	ug/kg	--	--	--	--	<1 {<0.5}	<0.99 {<0.49}	<0.99 {<0.49}	<0.99 {<0.5}	
p-Isopropyltoluene	ug/kg	--	--	--	--	<1 {<0.72}	<0.99 {<0.71}	<0.99 {<0.71}	<0.99 {<0.71}	
sec-Butylbenzene	ug/kg	--	--	--	--	<2 {<0.67}	<2 {<0.66}	<2 {<0.66}	<2 {<0.66}	
Styrene	ug/kg	--	--	--	--	<1 {<0.58}	<0.99 {<0.57}	<0.99 {<0.57}	<0.99 {<0.58}	
tert-Butylbenzene	ug/kg	--	--	--	--	<2 {<0.62}	<2 {<0.61}	<2 {<0.61}	<2 {<0.62}	
Tetrachloroethene	ug/kg	--	--	14,000	--	<1 {<0.49}	<0.99 {<0.48}	<0.99 {<0.48}	<0.99 {<0.49}	
Toluene	ug/kg	--	--	--	--	<1 {<0.5}	<0.99 {<0.49}	<0.99 {<0.49}	<0.99 {<0.5}	
trans-1,2-Dichloroethene	ug/kg	--	--	--	--	<1 {<0.7}	<0.99 {<0.69}	<0.99 {<0.69}	<0.99 {<0.69}	
trans-1,3-Dichloropropene	ug/kg	--	--	--	--	<1 {<0.61}	<0.99 {<0.6}	<0.99 {<0.6}	<0.99 {<0.61}	
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	--	<1 {<0.5}	<0.99 {<0.49}	<0.99 {<0.49}	<0.99 {<0.5}	
Trichlorofluoromethane	ug/kg	--	--	--	--	<2 {<0.54}	<2 {<0.53}	<2 {<0.53}	<2 {<0.54}	
Vinyl acetate	ug/kg	--	--	--	--	<5 {<2.5}	<4.9 {<2.5}	<4.9 {<2.5}	<5 {<2.5}	
Vinyl chloride	ug/kg	--	--	4,000	--	<2 {<0.91}	<2 {<0.9}	<2 {<0.9}	<2 {<0.9}	
RADIONUCLIDES	--	--	--	--	--	R	R	R	R	

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**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