WASTE CHARACTERIZATION: IN-SITU SOIL LOCATED AT
ISRA AREA II PLANNED EXCAVATION A2LF-1

Introduction

This report presents supporting detailed information for the September 3, 2009 in-situ characterization of prospective soil wastes from planned ISRA excavations in SSFL Area II.

Background

In-situ characterization of soil destined to be excavated from designated locations in SSFL Area II 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 II 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 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 A2LF-1 was based largely on the Group 2 RFI results. Evaluation of these data and other sources of relevant information suggested that Petroleum Hydrocarbons (TPH), Volatile Organic Compounds (VOC), Regulated metals, Polychlorinated Biphenyls (PCB), and Semi-Volatile Organic Compounds (SVOC) should be addressed in the A2LF-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 TPH, VOC, CAM 17 metals, PCBs, and SVOCs. All samples were collected, contained, and handled according to field practice requirements in SW-846.

Results

Analytical results for the A2LF-1 planned excavation area are presented in TestAmerica report ISI0508 issued on 9/25/09. TPH in the C10 - C40 range was detected in all of the samples. Concentrations were low, with a maximum of 54 mg/kg. No Petroleum Hydrocarbons in the C6 - C12 range (gasoline) were detected. A trace concentration of Acetone was detected at 0.015 mg/kg, possibly a lab artifact. No other VOCs were detected. No SVOCs were detected, and no PCBs were detected.

Low concentrations of some regulated metals were detected. Chromium was detected at concentrations ranging from 17 mg/kg to 23 mg/kg. Lead was detected at concentrations

ranging from 2.6 mg/kg to 13 mg/kg. These and all other detected regulated metals were well below regulatory thresholds.

Determination

According to analytical results and generator knowledge, the soil in the planned excavation footprint of SSFL Area II A2LF-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 soil in A2LF-1 is NON-HAZARDOUS.

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

A2LF-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

			Object Name:		**ISWC0104**	**ISWC0105**	**ISWC0106**	**ISWC0107**
			Sample Name:		ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
			Collection Date:		9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):		0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	**UNITS**	**TTLC**	**WET Leachate Testing Trigger[a]**	**TCLP Leachate Testing Trigger[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
METALS								
Antimony	mg/kg	500	150	--	<10	<10	<10	<10
Arsenic	mg/kg	500	50	100	4.2	4.8	4.2	4.4
Barium	mg/kg	10,000	1,000	2,000	88	84	61	70
Beryllium	mg/kg	75	7.5	--	0.64	0.64	0.58	0.57
Cadmium	mg/kg	100	10	20	<0.50	<0.50	<0.50	<0.50
Chromium	mg/kg	500	50	100	23	23	18	18
Cobalt	mg/kg	8,000	800	--	5.8	5.9	4.8	5.1
Copper	mg/kg	2,500	250	--	9.5	8.8	6.9	9.2
Lead	mg/kg	1,000	50	100	13	4.5	2.6	5.9
Mercury	mg/kg	20	2	4	0.015 J	0.012 J	0.0067 J	0.013 J
Molybdenum	mg/kg	3,500	3,500	--	<2.0	<2.0	<2.0	<2.0
Nickel	mg/kg	2,000	200	--	18	17	14	14
Selenium	mg/kg	100	10	20	<2.0	<2.0	<2.0	<2.0
Silver	mg/kg	500	50	100	<1.0	<1.0	<1.0	<1.0
Thallium	mg/kg	700	70	--	<10	<10	<10	<10
Vanadium	mg/kg	2,400	240	--	38	38	30	32
Zinc	mg/kg	5,000	2,500	--	62	54	43	50
TPH								
Volatile Fuel Hydrocarbons (C6-C12)	mg/kg	--	--	--	0.014	0.011	0.010	0.015
TPH DRO (C10-C24)	mg/kg	--	--	--	15	<5.0	<5.0	10
TPH EFH (C10-C40)	mg/kg	--	--	--	54	22	14	48
TPH ORO (C25-C40)	mg/kg	--	--	--	39	18	9.7	38
PCBs								
Aroclor 1016	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1221	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1232	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1242	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1248	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1254	ug/kg	50,000	50,000	--	<50	<50	<50	<50
Aroclor 1260	ug/kg	50,000	50,000	--	<50	<50	<50	<50
VOCs								
1,1,1,2-Tetrachloroethane	ug/kg	--	--	--	<2.0	<2.0	<2.0 l	<1.9
1,1,1-Trichloroethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
1,1,2,2-Tetrachloroethane	ug/kg	--	--	--	<2.0 l	<2.0 l	<2.0 l	<1.9 l
1,1,2-Trichloroethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97

INTERIM SOURCE REMOVAL ACTION (ISRA) - OUTFALL 009

A2LF-1 WASTE CHARACTERIZATION RESULTS
THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

			Object Name:		**ISWC0104**	**ISWC0105**	**ISWC0106**	**ISWC0107**
			Sample Name:		ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
			Collection Date:		9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):		0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	**UNITS**	**TTLC**	**WET Leachate Testing Trigger[a]**	**TCLP Leachate Testing Trigger[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
1,1-Dichloroethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
1,1-Dichloroethene	ug/kg	--	--	14,000	<2.0	<2.0	<2.0	<1.9
1,1-Dichloropropene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
1,2,3-Trichlorobenzene	ug/kg	--	--	--	<2.0 C, I, M2, R-3	<2.0 I	<2.0 I	<1.9 I
1,2,3-Trichloropropane	ug/kg	--	--	--	<2.0 I, M1	<2.0 I	<2.0 I	<1.9 I
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<2.0 I, M2	<2.0 I	<2.0 I	<1.9 I
1,2,4-Trimethylbenzene	ug/kg	--	--	--	<0.99 I, M1, R-3	<0.98 I	<0.99 I	<0.97 I
1,2-Dibromo-3-chloropropane	ug/kg	--	--	--	<9.9 I	<9.8 I	<9.9 I	<9.7 I
1,2-Dibromoethane (EDB)	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97
1,2-Dichlorobenzene	ug/kg	--	--	--	<0.99 I	<0.98 I	<0.99 I	<0.97 I
1,2-Dichloroethane	ug/kg	--	--	10,000	<0.99	<0.98	<0.99	<0.97
1,2-Dichloropropane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
1,3,5-Trimethylbenzene	ug/kg	--	--	--	<0.99 I, M1	<0.98 I	<0.99 I	<0.97 I
1,3-Dichlorobenzene	ug/kg	--	--	--	<0.99 C, I	<0.98 I	<0.99 I	<0.97 I
1,3-Dichloropropane	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97
1,4-Dichlorobenzene	ug/kg	--	--	--	<0.99 I	<0.98 I	<0.99 I	<0.97 I
2,2-Dichloropropane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
2-Butanone (MEK)	ug/kg	--	--	4,000,000	<9.9	<9.8	<9.9	<9.7
2-Chlorotoluene	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I
2-Hexanone	ug/kg	--	--	--	<9.9	<9.8	<9.9 I	<9.7
4-Chlorotoluene	ug/kg	--	--	--	<2.0 I, M1	<2.0 I	<2.0 I	<1.9 I
4-Methyl-2-pentanone (MIBK)	ug/kg	--	--	--	<5.0	<4.9	<4.9	<4.9
Acetone	ug/kg	--	--	--	<9.9	<9.8	<9.9	15
Benzene	ug/kg	--	--	10,000	<0.99	<0.98	<0.99	<0.97
Bromobenzene	ug/kg	--	--	--	<2.0 I, M1, R-3	<2.0 I	<2.0 I	<1.9 I
Bromochloromethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9
Bromodichloromethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
Bromoform	ug/kg	--	--	--	<2.0	<2.0	<2.0 I	<1.9
Bromomethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9
Carbon Disulfide	ug/kg	--	--	--	<5.0	<4.9	<4.9	<4.9
Carbon tetrachloride	ug/kg	--	--	10,000	<2.0	<2.0	<2.0	<1.9
Chlorobenzene	ug/kg	--	--	2,000,000	<0.99	<0.98	<0.99 I	<0.97
Chloroethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9
Chloroform	ug/kg	--	--	120,000	<0.99	<0.98	<0.99	<0.97
Chloromethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9
cis-1,2-Dichloroethene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97

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			Sample Name:		ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
			Collection Date:		9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):		0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	**UNITS**	**TTLC**	**WET Leachate Testing Trigger[a]**	**TCLP Leachate Testing Trigger[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
cis-1,3-Dichloropropene	ug/kg	--	--	--	<0.99	<0.98 L	<0.99 L	<0.97 L
Dibromochloromethane	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97
Dibromomethane	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
Dichlorodifluoromethane	ug/kg	--	--	--	<5.0	<4.9	<4.9	<4.9
Ethylbenzene	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97
Hexachlorobutadiene	ug/kg	--	--	--	<2.0 C, I	<2.0 I	<2.0 I	<1.9 I
Isopropylbenzene	ug/kg	--	--	--	<0.99 I, M1	<0.98 I	<0.99 I	<0.97 I
m,p-Xylenes	ug/kg	--	--	--	<2.0	<2.0	<2.0 I	<1.9
Methylene chloride	ug/kg	--	--	--	<9.9	<9.8	<9.9	<9.7
Methyl-tert-butyl Ether (MTBE)	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9
Naphthalene	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I
n-Butylbenzene	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I
n-Propylbenzene	ug/kg	--	--	--	<0.99 I, M1	<0.98 I	<0.99 I	<0.97 I
o-Xylene	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97
p-Isopropyltoluene	ug/kg	--	--	--	<0.99 C, I	<0.98 I	<0.99 I	<0.97 I
sec-Butylbenzene	ug/kg	--	--	--	<2.0 I	<2.0 I	<2.0 I	<1.9 I
Styrene	ug/kg	--	--	--	<0.99	<0.98	<0.99 I	<0.97
tert-Butylbenzene	ug/kg	--	--	--	<2.0 C, I, M1, R-3	<2.0 I	<2.0 I	<1.9 I
Tetrachloroethene	ug/kg	--	--	14,000	<0.99	<0.98	<0.99 I	<0.97
Toluene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
trans-1,2-Dichloroethene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
trans-1,3-Dichloropropene	ug/kg	--	--	--	<0.99	<0.98	<0.99	<0.97
Trichloroethene	ug/kg	2,040,000	2,040,000	10,000	<0.99	<0.98	<0.99	<0.97
Trichlorofluoromethane	ug/kg	--	--	--	<2.0	<2.0	<2.0	<1.9
Vinyl acetate	ug/kg	--	--	--	<5.0 M2	<4.9	<4.9	<4.9
Vinyl chloride	ug/kg	--	--	4,000	<2.0	<2.0	<2.0	<1.9
SVOCs								
1,2,4-Trichlorobenzene	ug/kg	--	--	--	<330	<330	<330	<330
1,2-Dichlorobenzene	ug/kg	--	--	--	<330	<330	<330	<330
1,2-Diphenylhydrazine/Azobenzene	ug/kg	--	--	--	<330	<330	<330	<330
1,3-Dichlorobenzene	ug/kg	--	--	--	<330	<330	<330	<330
1,4-Dichlorobenzene	ug/kg	--	--	150,000	<330	<330	<330	<330
2,4,5-Trichlorophenol	ug/kg	--	--	8,000,000	<330	<330	<330	<330
2,4,6-Trichlorophenol	ug/kg	--	--	40,000	<330	<330	<330	<330
2,4-Dichlorophenol	ug/kg	--	--	--	<330	<330	<330	<330
2,4-Dimethylphenol	ug/kg	--	--	--	<330	<330	<330	<330

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			Sample Name:		ISWC0104S001	ISWC0105S001	ISWC0106S001	ISWC0107S001
			Collection Date:		9/3/2009	9/3/2009	9/3/2009	9/3/2009
			Sample Depth (feet):		0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	**UNITS**	**TTLC**	**WET Leachate Testing Trigger[a]**	**TCLP Leachate Testing Trigger[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
2,4-Dinitrophenol	ug/kg	--	--	--	<660	<660	<660	<660
2,4-Dinitrotoluene	ug/kg	--	--	2,600	<330	<330	<330	<330
2,6-Dinitrotoluene	ug/kg	--	--	--	<330	<330	<330	<330
2-Chloronaphthalene	ug/kg	--	--	--	<330	<330	<330	<330
2-Chlorophenol	ug/kg	--	--	--	<330	<330	<330	<330
2-Methylnaphthalene	ug/kg	--	--	--	<330	<330	<330	<330
2-Methylphenol	ug/kg	--	--	--	<330	<330	<330	<330
2-Nitroaniline	ug/kg	--	--	--	<330	<330	<330	<330
2-Nitrophenol	ug/kg	--	--	--	<330	<330	<330	<330
3,3'-Dichlorobenzidine	ug/kg	--	--	--	<830	<830	<830	<830
3-Nitroaniline	ug/kg	--	--	--	<330	<330	<330	<330
4,6-Dinitro-2-methylphenol	ug/kg	--	--	--	<420	<420	<420	<420
4-Bromophenyl phenyl ether	ug/kg	--	--	--	<330	<330	<330	<330
4-Chloro-3-methylphenol	ug/kg	--	--	--	<330	<330	<330	<330
4-Chloroaniline	ug/kg	--	--	--	<330	<330	<330	<330
4-Chlorophenyl phenyl ether	ug/kg	--	--	--	<330	<330	<330	<330
4-Methylphenol	ug/kg	--	--	--	<330 L	<330 L	<330 L	<330 L
4-Nitroaniline	ug/kg	--	--	--	<830	<830	<830	<830
4-Nitrophenol	ug/kg	--	--	--	<830	<830	<830	<830
Acenaphthene	ug/kg	--	--	--	<330	<330	<330	<330
Acenaphthylene	ug/kg	--	--	--	<330	<330	<330	<330
Aniline	ug/kg	--	--	--	<420	<420	<420	<420
Anthracene	ug/kg	--	--	--	<330	<330	<330	<330
Benzidine	ug/kg	--	--	--	<660	<660	<660	<660
Benzo(a)anthracene	ug/kg	--	--	--	<330	<330	<330	<330
Benzo(a)pyrene	ug/kg	--	--	--	<330	<330	<330	<330
Benzo(b)fluoranthene	ug/kg	--	--	--	<330	<330	<330	<330
Benzo(g,h,i)perylene	ug/kg	--	--	--	<330	<330	<330	<330
Benzo(k)fluoranthene	ug/kg	--	--	--	<330	<330	<330	<330
Benzoic acid	ug/kg	--	--	--	<830	<830	<830	<830
Benzyl alcohol	ug/kg	--	--	--	<330	<330	<330	<330
Bis(2-chloroethoxy)methane	ug/kg	--	--	--	<330	<330	<330	<330
Bis(2-chloroethyl)ether	ug/kg	--	--	--	<170	<170	<170	<170
Bis(2-chloroisopropyl)ether	ug/kg	--	--	--	<330	<330	<330	<330
Bis(2-ethylhexyl)phthalate	ug/kg	--	--	--	<330	<330	<330	<330
Butyl benzyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330

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			Sample Depth (feet):		0.1 - 0.6	0.4 - 0.9	1.5 - 2.0	0.1 - 0.6
ANALYTE	**UNITS**	**TTLC**	**WET Leachate Testing Trigger[a]**	**TCLP Leachate Testing Trigger[b]**	**RESULT**	**RESULT**	**RESULT**	**RESULT**
Chrysene	ug/kg	--	--	--	<330	<330	<330	<330
Dibenz(a,h)anthracene	ug/kg	--	--	--	<420	<420	<420	<420
Dibenzofuran	ug/kg	--	--	--	<330	<330	<330	<330
Diethyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330
Dimethyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330
Di-n-butyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330
Di-n-octyl phthalate	ug/kg	--	--	--	<330	<330	<330	<330
Fluoranthene	ug/kg	--	--	--	<330	<330	<330	<330
Fluorene	ug/kg	--	--	--	<330	<330	<330	<330
Hexachlorobenzene	ug/kg	--	--	2,600	<330	<330	<330	<330
Hexachlorobutadiene	ug/kg	--	--	10,000	<330	<330	<330	<330
Hexachlorocyclopentadiene	ug/kg	--	--	--	<830	<830	<830	<830
Hexachloroethane	ug/kg	--	--	60,000	<330	<330	<330	<330
Indeno(1,2,3-cd)pyrene	ug/kg	--	--	--	<330	<330	<330	<330
Isophorone	ug/kg	--	--	--	<330	<330	<330	<330
Naphthalene	ug/kg	--	--	--	<330	<330	<330	<330
Nitrobenzene	ug/kg	--	--	40,000	<330	<330	<330	<330
N-Nitrosodimethylamine	ug/kg	--	--	--	<330	<330	<330	<330
N-Nitroso-di-n-propylamine	ug/kg	--	--	--	<250	<250	<250	<250
N-Nitrosodiphenylamine	ug/kg	--	--	--	<330	<330	<330	<330
Pentachlorophenol	ug/kg	17,000	17,000	2,000,000	<830	<830	<830	<830
Phenanthrene	ug/kg	--	--	--	<330	<330	<330	<330
Phenol	ug/kg	--	--	--	<330	<330	<330	<330
Pyrene	ug/kg	--	--	--	<330	<330	<330	<330
RADIONUCLIDES	--	--	--	--	R	R	R	R

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THE BOEING COMPANY
SANTA SUSANA FIELD LABORATORY

Notes:

"--" - not analyzed / not applicable

[1] - WET Leachate Testing Trigger = STLC limit * 10

[2] - TCLP Leachate Testing Trigger = TCLP limit * 20

I - Internal Standard recovery was outside of method limits. Matrix interference was confirmed.

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.

L - Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above the acceptance limits. Analyte not detected, data not impacted.

M1 - The MS and/or MSD were above the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

M2 - The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

M7 - The MS and/or MSD were above the acceptance limits. See Blank Spike (LCS).

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 has prepared a document dated September 21, 2009 that provides the radiological results and statistical analysis of the Outfall 009 A2LF 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.

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

RL1 - Reporting limit raised due to sample matrix effects.