

Appendix H: Analytical Results

Appendix H-1: XRF Data




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MEMORANDUM

DATE: 4 October 2006

TO: Ben Castellana, Ph.D., Weston Solutions, Sherman Oaks

FROM: Paul Swift, Ph.D., Weston Solutions, Seattle 

SUBJECT: Review and Validation – Metals by X-Ray Fluorescence Spectrometry
Field Laboratory Groups: 062206, 062306, 062406, 062506, 062606, 062706, 062806, and 062906
Site: Halaco Engineering Company, Oxnard, California
Project: Integrated Assessment

CONTRACT: GSA W91238-05-F-0052

WORK ORDER: 12767.062.317.5000

cc: Weston Solutions project file

The quality assurance review and validation of analytical results from 387 solid samples (soils and sediments), laboratory groups **062206, 062306, 062406, 062506, 062606, 062706, 062806,, and 062906**, collected from the Halaco Engineering Company site, 6200 Perkins Road, Oxnard, Ventura County, California between 26 June and 29 June, 2006 has been completed.

The solid samples were analyzed for the range of metals detectable using Niton Cd-109 and Am-241 x-ray fluorescence (XRF) excitation sources. Of these, only results for selected CLP Target Analyte List (TAL) metals (antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, selenium, silver, tin, vanadium, and zinc) and molybdenum were reviewed and validated based on comparability with fixed-laboratory results generated for the project.

Samples were analyzed on-site by Weston Solutions, Inc., in an abandoned office space that was configured as a close-support laboratory. Samples were prepared and analyzed following EPA SW846 Method 6200, field-portable x-ray fluorescence spectrometry (FPXRP; also XRF), using a Niton XLp 733 equipped with Niton Cd-109 and Am-241 excitation sources.

EDD Summary Reports, listing the sample ID and method information for all laboratory groups for this review are included as an attachment.

Data Review, Verification, Validation, and Qualification

The following comments refer to the laboratory performance in meeting the quality control criteria described in the individual analytical methods. The review follows the format described in the *National Functional Guidelines for Inorganic Data Review* (USEPA 2004) and specific procedural details provided in the analytical method.

All QC criteria (instrument calibrations, calibration check sample recoveries, and frequencies of QC sample analyses) were reviewed and verified manually.

Data validation was performed to assess overall data quality and usability relative to project data quality objectives (DQOs) specified in the project Quality Assurance Project Plan (QAPP).

METALS ANALYSIS (SW846 6200)

1. Timeliness – acceptable

All samples met project-specific holding time criterion of 180 days for the initial sample analysis.

2. Sample Preparation – acceptable

Whenever possible, samples were analyzed on an *as-received* basis. In this case, the moisture content and particle-size distribution of each sample aliquot was evaluated by an analyst with extensive experience performing the method. Samples were sieved through a 10-mesh (2-micon) screen in order to remove non-representative and oversized materials.

Samples with appreciable moisture content or consisting of a wide range of particle sizes were heated to apparent dryness and pulverized using a mortar and pestle.

Whether processed or not, representative aliquots of field samples were placed into 37-mm polyethylene XRF sample cups whose exposure (bottom) surface consisted of a single layer of XRF-transparent Mylar film. Filled sample cups were capped then manipulated to facilitate settling of fine-grained material into any void spaces on the exposure surface prior to analysis.

3. Initial Calibrations – acceptable

For the current project, the Niton instrument employed a single-point internal standard for energy and peak-width calibration. This calibration was performed and verified daily using a three-point calibration curve prepared with NIST-traceable soils standards.

All initial calibrations met the acceptance criteria specified in the analytical method.

4. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis, using the mid-level calibration standard, yielded results that met the frequency and recovery criteria specified in the analytical method.

5. Detection Limits – acceptable

Reporting limits, determined on a per-sample basis using signal to noise considerations, were adequate to meet project objectives.

6. Blank Sample Analysis – acceptable

a) Method Blanks

The method blank sample consisted of NIST-Traceable Ottawa sand. Laboratory method blank analysis frequency and recovery criteria were met.

b) Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

7. Standard Reference Material Analysis (SRM) – acceptable

Recovery of the analytes from the SRM sample met the acceptance criteria specified in the analytical method.

8. Matrix Spike Sample Analysis (MS) – not applicable

Matrix spike analysis is not required by the analytical method.

9. Laboratory Duplicate Sample Analysis – acceptable

Laboratory duplicate sample analysis yielded acceptable precision values.

10. Field Duplicate Sample Analysis – acceptable

Field duplicate samples analysis yielded acceptable precision values.

11. Serial Dilution Analysis – not applicable

Serial dilution analysis is not required by the analytical method..

12. Interference Check Sample Analysis – not applicable

Interference check sample analysis is not required by the analytical method.

13. Sample Analysis – acceptable

The Niton instrument utilizes Compton scattering to minimize sample matrix effects. The ratio of elastically-scattered radiation to inelastically-scattered radiation (Compton scattering) was used to normalize reported analyte concentrations based on particle size, moisture, and presence of light elements in the sample matrix.

Because the diminished activity of the Cd-109 source, a sample counting time of 240 seconds was used; the Am-240 counting time was also set to 240 seconds.

All laboratory deliverables were present. No discrepancies were noted.

Data Assessment and Reconciliation with Project Data Quality Objectives

Data review and validation was performed by an experienced quality assurance chemist who performed the field laboratory analyses but was not directly involved in the collection of samples for the project.

Although the analytical method followed yielded definitive (defensible) analytical results, independent review is required if the resulting data are to be used for any regulatory purposes.

Upon consideration of the comments and data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

Any data qualifiers applied by the laboratory have been removed from the data summary sheets and superceded by data validation qualifiers as follow:

The following qualifiers are used to modify the data quality and usefulness of individual analytical results.

U - The compound was analyzed for, but was not detected.

XRF Data Halaco Engineering, Company IA

XRF ID	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q	As Q	Ba Q	Cd Q	Cs Q	Cr Q
PRGr								31	22	5,400	37		210
TTLc								500	500	10,000	100		2500
SBD31	10 BEACH BKG	SED	Beach	bkgd	6/29/2006	15:38	mg/kg	57	5.9 U	828	21.6 U	27.3	82
SBD32	10 BEACH BKG	SED	Beach	bkgd	6/29/2006	15:49	mg/kg	46 U	5.8 U	758	20.2 U	23.2	93
SBD33	10 BEACH BKG	SED	Beach	bkgd	6/29/2006	15:57	mg/kg	48 U	5.8 U	712	20.8 U	32.6	102
SBD34	10 BEACH BKG	SED	Beach	bkgd	6/29/2006	16:06	mg/kg	46 U	5.9 U	693	20.5 U	29.9	89
SDB35	10 BEACH BKG	SED	Beach	bkgd	6/29/2006	16:26	mg/kg	50 U	5.7 U	670	22.3 U	32.7	123
SDB36	10 BEACH BKG	SED	Beach	bkgd	6/29/2006	16:40	mg/kg	47 U	5.6 U	747	20.8 U	40.3	86
SBD22	10 BEACH	SED	Beach		6/29/2006	14:45	mg/kg	50 U	6.0 U	808	22.0 U	40.7	149
SBD23	10 BEACH	SED	Beach		6/29/2006	14:54	mg/kg	59 U	9.0 U	630	26.3 U	27.7	960
SBD24	10 BEACH	SED	Beach		6/29/2006	15:02	mg/kg	60	8.3 U	580	23.7 U	26.8	708
SBD25	10 BEACH	SED	Beach		6/29/2006	15:11	mg/kg	50 U	6.8 U	641	21.9 U	29.0	336
SBD26	10 BEACH	SED	Beach		6/29/2006	15:20	mg/kg	49 U	7.8 U	648	25.1 U	43.4	546
SBD30	10 BEACH	SED	Beach		6/29/2006	15:29	mg/kg	53 U	6.7 U	653	24.9 U	36.4	208
SDB1	10 BEACH	SED	Beach		6/29/2006	11:09	mg/kg	47 U	5.9 U	1009	20.6 U	38.5	75 U
SDB10	10 BEACH	SED	Beach		6/29/2006	12:42	mg/kg	47 U	5.7 U	769	21.4 U	36.4	78
SDB11	10 BEACH	SED	Beach		6/29/2006	12:50	mg/kg	50 U	5.8 U	673	21.8 U	23.0	160
SDB12	10 BEACH	SED	Beach		6/29/2006	13:09	mg/kg	50 U	6.2 U	668	22.4 U	32.9	87
SDB13	10 BEACH	SED	Beach		6/29/2006	13:18	mg/kg	48 U	5.6 U	577	22.0 U	38.0	74 U
SDB14	10 BEACH	SED	Beach		6/29/2006	13:26	mg/kg	44 U	5.8 U	547	21.3 U	31.1	75 U
SDB15	10 BEACH	SED	Beach		6/29/2006	13:35	mg/kg	50 U	5.8 U	628	23.2 U	35.6	82
SDB16	10 BEACH	SED	Beach		6/29/2006	13:43	mg/kg	50 U	5.6 U	628	21.8 U	31.6	89
SDB17	10 BEACH	SED	Beach		6/29/2006	13:52	mg/kg	49 U	7.7 U	568	21.4 U	35.5	590
SDB18	10 BEACH	SED	Beach		6/29/2006	14:01	mg/kg	67	8.1 U	610	23.3 U	20.8 U	737
SDB19	10 BEACH	SED	Beach		6/29/2006	14:10	mg/kg	49 U	5.8 U	751	21.7 U	35.4	76 U
SDB2	10 BEACH	SED	Beach		6/29/2006	11:27	mg/kg	48 U	5.7 U	837	21.2 U	45.0	75 U
SDB20	10 BEACH	SED	Beach		6/29/2006	14:18	mg/kg	53 U	8.2 U	654	25.6 U	47.8	797
SDB21	10 BEACH	SED	Beach		6/29/2006	14:26	mg/kg	56 U	7.3 U	628	22.5 U	22.2 U	598
SDB3	10 BEACH	SED	Beach		6/29/2006	11:36	mg/kg	46 U	5.9 U	751	21.4 U	32.9	201
SDB4	10 BEACH	SED	Beach		6/29/2006	11:44	mg/kg	45 U	6.0 U	897	19.8 U	52.0	201
SDB5	10 BEACH	SED	Beach		6/29/2006	11:53	mg/kg	49 U	6.0 U	717	22.0 U	31.0	216
SDB6	10 BEACH	SED	Beach		6/29/2006	12:04	mg/kg	47 U	5.9 U	717	22.9 U	38.0	102
SDB7	10 BEACH	SED	Beach		6/29/2006	12:13	mg/kg	46 U	5.7 U	707	21.4 U	22.8	165
SDB8	10 BEACH	SED	Beach		6/29/2006	12:24	mg/kg	45 U	6.0 U	820	20.6 U	44.6	123
SDB9	10 BEACH	SED	Beach		6/29/2006	12:32	mg/kg	52 U	5.6 U	807	23.2 U	20.8 U	209
SDM 3	AN3 BKG	SED	Marine	bkgd	6/28/2006	10:02	mg/kg	53 U	6.8 U	887	23.5 U	27.4	165
SDM1	AN1 BKG	SED	Marine	bkgd	6/28/2006	9:32	mg/kg	50 U	7.1 U	950	22.0 U	32.3	136
SDM2	AN2 BKG	SED	Marine	bkgd	6/28/2006	9:42	mg/kg	49 U	6.8 U	872	23.9 U	33.9	93
SDM4	BN1 BKG	SED	Marine	bkgd	6/28/2006	10:12	mg/kg	52 U	6.9 U	866	21.1 U	32.7	118
SDM5	BN3 BKG	SED	Marine	bkgd	6/28/2006	10:28	mg/kg	51 U	6.9 U	883	22.1 U	31.9	87 U
SDM6	BN4 BKG	SED	Marine	bkgd	6/28/2006	10:38	mg/kg	53 U	7.1 U	900	22.8 U	31.9	112
SDM7	FN1 BKG	SED	Marine	bkgd	6/28/2006	10:47	mg/kg	51 U	9.6	941	22.2 U	36.7	133
SDM8	FN2 BKG	SED	Marine	bkgd	6/28/2006	10:57	mg/kg	49 U	6.9 U	936	23.6 U	40.0	153
SDM10	10 MARINE	SED	Marine		6/28/2006	11:16	mg/kg	51 U	6.8 U	892	21.4 U	29.1	113
SDM11	10 MARINE	SED	Marine		6/28/2006	11:26	mg/kg	53 U	7.1 U	866	22.7 U	37.2	89 U
SDM12	10 MARINE	SED	Marine		6/28/2006	11:34	mg/kg	54 U	6.8 U	939	24.0 U	21.6 U	91
SDM13	10 MARINE	SED	Marine		6/28/2006	11:56	mg/kg	50 U	6.6 U	943	24.1 U	43.0	120

XRF Data Halaco Engineering, Company IA

XRF ID	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q	As Q	Ba Q	Cd Q	Cs Q	Cr Q
PRGr								31	22	5,400	37		210
TTLc								500	500	10,000	100		2500
SDM14	10 MARINE	SED	Marine		6/28/2006	12:05	mg/kg	54 U	6.9 U	904	23.0 U	25.5	87 U
SDM15	10 MARINE	SED	Marine		6/28/2006	12:14	mg/kg	47 U	6.9 U	906	20.6 U	39.7	131
SDM16	10 MARINE	SED	Marine		6/28/2006	12:22	mg/kg	50 U	7.1 U	902	22.4 U	48.9	131
SDM17	10 MARINE	SED	Marine		6/28/2006	12:38	mg/kg	51 U	6.8 U	895	22.2 U	44.3	101
SDM18	10 MARINE	SED	Marine		6/28/2006	12:47	mg/kg	50 U	6.6 U	867	23.2 U	27.8	108
SDM19	10 MARINE	SED	Marine		6/28/2006	12:56	mg/kg	53 U	6.6 U	897	23.8 U	37.6	93
SDM20	10 MARINE	SED	Marine		6/28/2006	13:06	mg/kg	47 U	6.5 U	924	22.5 U	57.4	82 U
SDM21	10 MARINE	SED	Marine		6/28/2006	13:15	mg/kg	49 U	6.4 U	951	19.8 U	30.0	92
SDM22	10 MARINE	SED	Marine		6/28/2006	13:24	mg/kg	51 U	6.6 U	866	23.0 U	27.8	103
SDM23	10 MARINE	SED	Marine		6/28/2006	13:43	mg/kg	53 U	6.3 U	895	23.4 U	25.4	81 U
SDM24	10 MARINE	SED	Marine		6/28/2006	13:53	mg/kg	54 U	6.7 U	895	20.8 U	36.9	147
SDM25	10 MARINE	SED	Marine		6/28/2006	14:02	mg/kg	53 U	6.3 U	911	23.5 U	30.3	78 U
SDM26	10 MARINE	SED	Marine		6/28/2006	14:11	mg/kg	49 U	6.9	943	23.4 U	36.2	83 U
SDM27	10 MARINE	SED	Marine		6/28/2006	14:19	mg/kg	50 U	6.6 U	925	24.6 U	43.6	83 U
SDM9	10 MARINE	SED	Marine		6/28/2006	11:07	mg/kg	52 U	6.7 U	873	23.5 U	25.8	113
SDF1	4-5 OID	SED	OID		6/24/2006	15:36	mg/kg	63 U	8.1 U	574	28.5 U	26.2	134
SDF2	4-5 OID	SED	OID		6/24/2006	15:45	mg/kg	48 U	6.5 U	1054	22.3 U	56.7	88
SDF3	4-5 OID	SED	OID		6/24/2006	16:05	mg/kg	61 U	8.5 U	1180	22.8 U	25.1 U	113
SDF4	4-5 OID	SED	OID		6/24/2006	16:13	mg/kg	66	7.3 U	788	22.3 U	21.5 U	481
SDF5	4-5 OID	SED	OID		6/24/2006	16:22	mg/kg	60 U	7.5 U	803	26.4 U	34.1	92 U
SDF6	4-5 OID	SED	OID		6/26/2006	17:39	mg/kg	62 U	6.9 U	517	26.3 U	22.9 U	84 U
SWL31	6-7 WTL BKG	SED	wetlands	bkgd	6/23/2006	8:37	mg/kg	85	7.3 U	1470	25.0 U	37.5	81 U
SWL32	6-7 WTL BKG	SED	wetlands	bkgd	6/23/2006	8:46	mg/kg	54 U	6.7 U	915	24.5 U	30.9	82 U
SWL33	6-7 WTL BKG	SED	wetlands	bkgd	6/23/2006	8:56	mg/kg	54 U	6.1 U	768	23.1 U	21.6 U	79 U
SWL34	6-7 WTL BKG	SED	wetlands	bkgd	6/23/2006	9:05	mg/kg	55 U	7.6 U	871	26.5 U	31.5	88 U
SWL34DUP	6-7 WTL BKG	SED	wetlands	bkgd	6/23/2006	9:15	mg/kg	57 U	7.7 U	826	24.0 U	22.5 U	89 U
SWL35	6-7 WTL BKG	SED	wetlands	bkgd	6/23/2006	9:25	mg/kg	58 U	6.8 U	909	24.3 U	38.4	81 U
SWL36	6-7 WTL BKG	SED	wetlands	bkgd	6/23/2006	9:34	mg/kg	48 U	7.2 U	1064	22.0 U	50.1	138
SWL1	6-7 WTL	SED	wetlands		6/25/2006	16:34	mg/kg	59 U	13.7 U	1744	26.7 U	44.1	178
SWL10	6-7 WTL	SED	wetlands		6/26/2006	8:32	mg/kg	71	10.2 U	1317	26.1 U	26.4 U	117
SWL11	6-7 WTL	SED	wetlands		6/26/2006	8:41	mg/kg	52 U	9.7 U	1107	22.0 U	49.3	164
SWL12	6-7 WTL	SED	wetlands		6/26/2006	8:50	mg/kg	66 U	8.5 U	902	27.7 U	26.1	72
SWL13	6-7 WTL	SED	wetlands		6/26/2006	8:59	mg/kg	59 U	13.8	1423	25.3 U	58.1	144
SWL14	6-7 WTL	SED	wetlands		6/26/2006	9:09	mg/kg	52 U	10.8	1139	24.3 U	46.8	157
SWL15	6-7 WTL	SED	wetlands		6/26/2006	9:18	mg/kg	50 U	9.3 U	1019	22.9 U	42.0	143
SWL16	6-7 WTL	SED	wetlands		6/26/2006	9:27	mg/kg	62 U	14.4 U	1132	27.4 U	35.5	232
SWL17	6-7 WTL	SED	wetlands		6/26/2006	9:40	mg/kg	51 U	14.2 U	1139	25.8 U	45.7	240
SWL18	6-7 WTL	SED	wetlands		6/26/2006	9:52	mg/kg	57 U	16.5	1120	25.2 U	46.2	206
SWL19	6-7 WTL	SED	wetlands		6/26/2006	14:49	mg/kg	65 U	15.9 U	1493	29.0 U	37.9	284
SWL2	6-7 WTL	SED	wetlands		6/25/2006	16:43	mg/kg	52 U	11.3	1619	25.3 U	57.1	261
SWL20	6-7 WTL	SED	wetlands		6/26/2006	16:33	mg/kg	59 U	9.7 U	914	26.4 U	28.5	134
SWL21	6-7 WTL	SED	wetlands		6/26/2006	14:58	mg/kg	85	16.7 U	1921	29.9 U	53.8	317
SWL22	6-7 WTL	SED	wetlands		6/26/2006	15:07	mg/kg	73 U	27.3	4770	31.7 U	124.6	233
SWL23	6-7 WTL	SED	wetlands		6/26/2006	15:17	mg/kg	119	18.0	3803	32.2 U	62.1	219
SWL24	6-7 WTL	SED	wetlands		6/26/2006	15:26	mg/kg	53 U	8.5 U	1086	23.1 U	43.1	82 U

XRF Data Halaco Engineering, Company IA

XRF ID	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q	As Q	Ba Q	Cd Q	Cs Q	Cr Q
PRGr								31	22	5,400	37		210
TTLc								500	500	10,000	100		2500
SWL25	6-7 WTL	SED	wetlands		6/26/2006	15:35	mg/kg	57 U	8.9 U	1054	25.0 U	40.4	145
SWL26	6-7 WTL	SED	wetlands		6/26/2006	15:55	mg/kg	51 U	6.4 U	741	24.6 U	41.2	73
SWL27	6-7 WTL	SED	wetlands		6/26/2006	16:06	mg/kg	52 U	8.9 U	1028	21.7 U	33.3	170
SWL28	6-7 WTL	SED	wetlands		6/26/2006	16:14	mg/kg	58 U	7.4 U	1127	26.0 U	32.8	79 U
SWL29	6-7 WTL	SED	wetlands		6/26/2006	16:23	mg/kg	79	6.8 U	963	24.4 U	25.4 U	87 U
SWL3	6-7 WTL	SED	wetlands		6/25/2006	16:52	mg/kg	66 U	12.6 U	4294	28.3 U	137.7	248
SWL4	6-7 WTL	SED	wetlands		6/25/2006	17:00	mg/kg	55 U	12.3	1534	22.5 U	44.8	179
SWL5	6-7 WTL	SED	wetlands		6/25/2006	17:09	mg/kg	58 U	14.0 U	2242	24.5 U	65.8	203
SWL6	6-7 WTL	SED	wetlands		6/25/2006	17:28	mg/kg	74	9.9 U	1477	25.1 U	47.7	109
SWL7	6-7 WTL	SED	wetlands		6/25/2006	17:38	mg/kg	66	8.8 U	1670	25.4 U	46.5	151
SWL8	6-7 WTL	SED	wetlands		6/25/2006	17:48	mg/kg	56 U	12.1	1321	22.9 U	51.3	208
SWL9	6-7 WTL	SED	wetlands		6/26/2006	8:22	mg/kg	60 U	11.4 U	1444	27.4 U	57.7	161
R-1	RB-OB	SED			6/28/2006	18:04	mg/kg	69 U	3.9 U	21 U	27.3 U	20.4 U	53 U
SSA1	AGRISOIL	Soil	Ag		6/27/2006	12:18	mg/kg	58 U	6.5 U	793	25.4 U	40.3	85 U
SSA10	AGRISOIL	Soil	Ag		6/27/2006	13:45	mg/kg	54 U	6.9 U	797	21.6 U	26.5	89 U
SSA2	AGRISOIL	Soil	Ag		6/27/2006	12:27	mg/kg	51 U	6.7 U	839	24.1 U	34.3	111
SSA3	AGRISOIL	Soil	Ag		6/27/2006	12:36	mg/kg	56 U	6.6 U	865	22.8 U	29.8	82 U
SSA4	AGRISOIL	Soil	Ag		6/27/2006	12:45	mg/kg	58 U	6.4 U	765	26.5 U	25.7	83 U
SSA5	AGRISOIL	Soil	Ag		6/27/2006	12:54	mg/kg	60 U	6.6 U	835	25.3 U	27.6	84 U
SSA6	AGRISOIL	Soil	Ag		6/27/2006	13:09	mg/kg	51 U	6.8 U	816	21.7 U	32.5	88 U
SSA7	AGRISOIL	Soil	Ag		6/27/2006	13:18	mg/kg	58 U	6.7 U	763	26.4 U	34.5	128
SSA8	AGRISOIL	Soil	Ag		6/27/2006	13:28	mg/kg	58 U	7.1 U	872	23.8 U	23.9	111
SSA9	AGRISOIL	Soil	Ag		6/27/2006	13:37	mg/kg	64	7.0 U	822	28.4 U	32.7	90 U
SSN94	6-7-8 ADJACENT B	Soil	NCL	bkgd	6/23/2006	10:28	mg/kg	61 U	7.9 U	310	24.1 U	21.2 U	114 U
SSN95	6-7-8 ADJACENT B	Soil	NCL	bkgd	6/23/2006	9:57	mg/kg	59 U	7.3 U	722	24.6 U	22.5 U	91 U
SSN96	6-7-8 ADJACENT B	Soil	NCL	bkgd	6/23/2006	10:37	mg/kg	107	7.4 U	748	27.4 U	38.1	91 U
SSN97	6-7-8 ADJACENT B	Soil	NCL	bkgd	6/23/2006	10:06	mg/kg	61 U	7.5 U	695	26.5 U	27.2	88 U
SSN98	6-7-8 ADJACENT B	Soil	NCL	bkgd	6/23/2006	9:47	mg/kg	68	7.4 U	763	25.7 U	24.7 U	92 U
SSN99	6-7-8 ADJACENT B	Soil	NCL	bkgd	6/23/2006	10:51	mg/kg	71	7.2 U	621	27.3 U	27.3	90 U
SSN54	6-7-8 ADJACENT	Soil	NCL		6/23/2006	11:02	mg/kg	57 U	10.8 U	1628	25.8 U	52.8	268
SSN55	6-7-8 ADJACENT	Soil	NCL		6/23/2006	11:11	mg/kg	55 U	7.5 U	730	25.2 U	30.2	81 U
SSN56	6-7-8 ADJACENT	Soil	NCL		6/23/2006	11:19	mg/kg	66	7.5 U	1856	28.7 U	61.4	81 U
SSN57	6-7-8 ADJACENT	Soil	NCL		6/23/2006	11:31	mg/kg	72	9.0 U	1715	28.5 U	43.9	97
SSN58	6-7-8 ADJACENT	Soil	NCL		6/23/2006	15:13	mg/kg	82 U	16.0	5824	35.3 U	74.4	156
SSN59	6-7-8 ADJACENT	Soil	NCL		6/23/2006	11:40	mg/kg	61 U	10.7	922	26.0 U	23.8 U	105
SSN60	6-7-8 ADJACENT	Soil	NCL		6/23/2006	15:22	mg/kg	68 U	12.3 U	2806	30.3 U	67.1	200
SSN61	6-7-8 ADJACENT	Soil	NCL		6/23/2006	11:49	mg/kg	60 U	9.4 U	1918	23.0 U	49.7	135
SSN62	6-7-8 ADJACENT	Soil	NCL		6/23/2006	15:31	mg/kg	101	11.6 U	2121	28.2 U	50.6	131
SSN63	6-7-8 ADJACENT	Soil	NCL		6/23/2006	15:40	mg/kg	60 U	13.2	1938	25.5 U	52.8	112
SSN64	6-7-8 ADJACENT	Soil	NCL		6/23/2006	11:58	mg/kg	57 U	7.8 U	890	24.3 U	23.6	101
SSN65	6-7-8 ADJACENT	Soil	NCL		6/23/2006	14:52	mg/kg	56 U	7.4 U	620	23.9 U	34.8	90 U
SSN66	6-7-8 ADJACENT	Soil	NCL		6/23/2006	15:03	mg/kg	60 U	8.0 U	756	26.7 U	25.3	106
SSN67	6-7-8 ADJACENT	Soil	NCL		6/23/2006	15:49	mg/kg	55 U	8.3 U	1276	24.9 U	59.3	112
SSN68	6-7-8 ADJACENT	Soil	NCL		6/23/2006	15:57	mg/kg	58 U	9.1 U	1232	23.8 U	35.7	111
SSN69	6-7-8 ADJACENT	Soil	NCL		6/23/2006	16:09	mg/kg	62	12.0	1039	28.1 U	24.6 U	118

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XRF ID	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q	As Q	Ba Q	Cd Q	Cs Q	Cr Q
PRGr								31	22	5,400	37		210
TTLc								500	500	10,000	100		2500
SSN70	6-7-8 ADJACENT	Soil	NCL		6/23/2006	16:18	mg/kg	74	8.5 U	952	24.8 U	24.5 U	83 U
SSN71	6-7-8 ADJACENT	Soil	NCL		6/23/2006	16:39	mg/kg	53 U	7.7 U	697	26.7 U	43.5	87 U
SSN72	6-7-8 ADJACENT	Soil	NCL		6/23/2006	16:58	mg/kg	49 U	7.3 U	573	21.9 U	36.6	92 U
SSN73	6-7-8 ADJACENT	Soil	NCL		6/23/2006	16:48	mg/kg	53 U	7.3 U	674	24.6 U	51.1	86 U
SSN74	6-7-8 ADJACENT	Soil	NCL		6/23/2006	17:07	mg/kg	58 U	14.6	1086	26.3 U	40.9	131
SSN75	6-7-8 ADJACENT	Soil	NCL		6/23/2006	17:17	mg/kg	61 U	11.5 U	1788	26.7 U	68.4	228
SSN76	6-7-8 ADJACENT	Soil	NCL		6/23/2006	17:27	mg/kg	61	6.8 U	622	23.2 U	21.9 U	88 U
SSN77	6-7-8 ADJACENT	Soil	NCL		6/23/2006	17:36	mg/kg	53 U	7.2 U	591	21.4 U	20.3 U	93
SSN78	6-7-8 ADJACENT	Soil	NCL		6/23/2006	17:45	mg/kg	50 U	10.1 U	610	22.6 U	25.5	89 U
SSN79	6-7-8 ADJACENT	Soil	NCL		6/23/2006	17:54	mg/kg	119	4.6 U	473	35.3 U	26.5 U	56 U
SSN79	6-7-8-ADJACENT	Soil	NCL		6/24/2006	9:53	mg/kg	56 U	7.6 U	870	24.9 U	34.3	89 U
SSN80	6-7-8-ADJACENT	Soil	NCL		6/24/2006	10:02	mg/kg	59 U	11.4 U	1233	24.3 U	30.3	99
SSN81	6-7-8 ADJACENT	Soil	NCL		6/24/2006	8:50	mg/kg	60 U	9.6 U	1009	25.8 U	46.3	85 U
SSN82	6-7-8 ADJACENT	Soil	NCL		6/24/2006	8:58	mg/kg	60 U	9.9 U	1029	24.1 U	24.2	83 U
SSN83	6-7-8-ADJACENT	Soil	NCL		6/24/2006	10:12	mg/kg	62 U	8.3 U	800	25.9 U	24.5 U	96 U
SSN84	6-7-8-ADJACENT	Soil	NCL		6/24/2006	10:22	mg/kg	60 U	8.7 U	873	26.5 U	23.8 U	197
SSN85	6-7-8 ADJACENT	Soil	NCL		6/24/2006	9:07	mg/kg	54 U	8.5 U	689	26.7 U	40.8	120
SSN86	6-7-8-ADJACENT	Soil	NCL		6/24/2006	10:30	mg/kg	66 U	11.9 U	2043	26.4 U	52.4	138
SSN87	6-7-8 ADJACENT	Soil	NCL		6/24/2006	9:15	mg/kg	58 U	10.0 U	1472	28.2 U	51.6	113
SSN88	6-7-8 ADJACENT	Soil	NCL		6/24/2006	9:24	mg/kg	63	9.3 U	1199	23.6 U	39.8	128
SSN89	6-7-8 ADJACENT	Soil	NCL		6/24/2006	9:33	mg/kg	59 U	8.9 U	1641	25.1 U	48.6	140
SSN90	6-7-8 ADJACENT	Soil	NCL		6/29/2006	17:18	mg/kg	58 U	10.0 U	4449	27.0 U	143.1	199
SSN91	6-7-8 ADJACENT	Soil	NCL		6/29/2006	17:27	mg/kg	66 U	11.9 U	2690	30.6 U	59.9	133
SSN92	6-7-8 ADJACENT	Soil	NCL		6/29/2006	17:36	mg/kg	54 U	9.1 U	1287	25.3 U	49.5	91
SSN93	6-7-8 ADJACENT	Soil	NCL		6/29/2006	17:45	mg/kg	60 U	11.4 U	1314	23.5 U	25.0 U	138
SSR1	RESIDENTIAL	Soil	RES		6/28/2006	14:41	mg/kg	71	9.3	868	23.6 U	23.7	96
SSR10	RESIDENTIAL	Soil	RES		6/28/2006	16:19	mg/kg	47 U	7.0 U	956	20.6 U	29.4	106
SSR2	RESIDENTIAL	Soil	RES		6/28/2006	14:50	mg/kg	54 U	7.2 U	784	23.6 U	26.9	92 U
SSR3	RESIDENTIAL	Soil	RES		6/28/2006	14:58	mg/kg	49 U	7.1 U	854	22.3 U	36.3	92 U
SSR4	RESIDENTIAL	Soil	RES		6/28/2006	15:07	mg/kg	53 U	7.2 U	760	22.6 U	23.4	120
SSR5	RESIDENTIAL	Soil	RES		6/28/2006	15:22	mg/kg	49 U	7.2 U	787	23.2 U	37.7	92 U
SSR6	RESIDENTIAL	Soil	RES		6/28/2006	15:41	mg/kg	56 U	7.3 U	806	22.6 U	28.7	94 U
SSR7	RESIDENTIAL	Soil	RES		6/28/2006	15:52	mg/kg	83	10.2	922	23.0 U	28.3	87 U
SSR8	RESIDENTIAL	Soil	RES		6/28/2006	16:02	mg/kg	49 U	8.1 U	947	22.4 U	29.4	187
SSR9	RESIDENTIAL	Soil	RES		6/28/2006	16:11	mg/kg	49 U	9.2	830	22.3 U	28.5	100
SO2	OID SHORE	Soil	smelter		6/27/2006	17:42	mg/kg	141	11.3 U	350	40.5 U	26.5 U	63 U
SSN10-1	Well MW-13	Soil	smelter		6/22/2006	10:27	mg/kg	62 U	63.9	878	31.6 U	27.3	232
SSN10-4	Well MW-13	Soil	smelter		6/22/2006	10:36	mg/kg	64 U	24.6 U	855	31.5 U	23.5 U	149
SSN10-8	Well MW-13	Soil	smelter		6/22/2006	10:44	mg/kg	52 U	11.5	893	23.9 U	36.5	108
SSN1-1	1-SMELTER	Soil	smelter		6/24/2006	10:42	mg/kg	78	11.3 U	1435	26.8 U	42.3	126
SSN11-1	Well MW-14	Soil	smelter		6/22/2006	10:55	mg/kg	87	7.5 U	823	27.2 U	23.6 U	117
SSN11-4	Well MW-14	Soil	smelter		6/22/2006	11:07	mg/kg	53 U	6.8 U	951	20.2 U	34.9	116
SSN11-8	Well MW-14	Soil	smelter		6/22/2006	11:16	mg/kg	63 U	6.6 U	803	28.3 U	26.0	88 U
SSN1-2	1-SMELTER	Soil	smelter		6/24/2006	10:51	mg/kg	83	22.5 U	1081	26.2 U	35.5	102 U
SSN12-1	Well MW-15	Soil	smelter		6/22/2006	11:25	mg/kg	53 U	6.5 U	712	20.6 U	36.1	86 U

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XRF ID PRGr TTLC	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q 31 500	As Q 22 500	Ba Q 5,400 10,000	Cd Q 37 100	Cs Q	Cr Q 210 2500
SSN12-4	Well MW-15	Soil	smelter		6/22/2006	11:45	mg/kg	53 U	6.3 U	651	24.1 U	24.6	82 U
SSN12-8	Well MW-15	Soil	smelter		6/22/2006	11:54	mg/kg	59 U	7.3 U	694	28.4 U	41.5	98 U
SSN13	1 SMELTER	Soil	smelter		6/27/2006	16:19	mg/kg	67 U	10.0 U	8759	29.8 U	259.2	283
SSN14	1 SMELTER	Soil	smelter		6/27/2006	16:28	mg/kg	71	13.4 U	4182	32.6 U	98.6	364
SSN15	1 SMELTER	Soil	smelter		6/27/2006	16:37	mg/kg	92	10.6 U	4881	29.2 U	160.8	251
SSN16	1 SMELTER	Soil	smelter		6/27/2006	16:46	mg/kg	55 U	7.3 U	783	24.3 U	23.1	94 U
SSN17	1 SMELTER	Soil	smelter		6/27/2006	16:55	mg/kg	59 U	11.6 U	3568	27.2 U	99.6	254
SSN18	1 SMELTER	Soil	smelter		6/27/2006	17:04	mg/kg	60 U	7.1 U	1747	24.5 U	33.4	74 U
SSN1-8	1-SMELTER	Soil	smelter		6/24/2006	11:39	mg/kg	56 U	22.3 U	1019	23.9 U	22.7 U	94 U
SSN19	1 SMELTER	Soil	smelter		6/27/2006	17:13	mg/kg	68 U	4.1 U	1023	27.4 U	47.8	44 U
SSN20	1 SMELTER	Soil	smelter		6/27/2006	16:10	mg/kg	59 U	10.3 U	1786	24.7 U	51.6	173
SSN21	1 SMELTER	Soil	smelter		6/28/2006	8:17	mg/kg	54 U	7.5 U	716	21.8 U	29.5	106
SSN2-1	1-SMELTER	Soil	smelter		6/24/2006	11:50	mg/kg	73 U	6.5 U	497	29.7 U	25.8	57 U
SSN2-1DUP	1-SMELTER	Soil	smelter		6/24/2006	12:12	mg/kg	54 U	11.8 U	1073	24.4 U	45.5	89 U
SSN22	1 SMELTER	Soil	smelter		6/28/2006	8:27	mg/kg	51 U	8.4	1088	22.9 U	38.7	175
SSN23	1 SMELTER	Soil	smelter		6/28/2006	8:36	mg/kg	58 U	9.9 U	871	24.9 U	31.4	171
SSN24	1 SMELTER	Soil	smelter		6/28/2006	8:45	mg/kg	51 U	8.4 U	572	22.6 U	19.9 U	151
SSN2-4	1-SMELTER	Soil	smelter		6/24/2006	12:23	mg/kg	58 U	27.8	1309	26.5 U	24.2 U	102 U
SSN25	1 SMELTER	Soil	smelter		6/28/2006	8:54	mg/kg	55 U	16.1 U	968	24.7 U	24.1	175
SSN26	1 SMELTER	Soil	smelter		6/28/2006	9:02	mg/kg	75	8.6 U	588	25.8 U	22.7 U	160
SSN27	1 SMELTER	Soil	smelter		6/28/2006	9:11	mg/kg	54 U	12.7 U	1106	25.4 U	23.3 U	241
SSN28	1 SMELTER	Soil	smelter		6/28/2006	9:21	mg/kg	52 U	10.0 U	1006	24.6 U	32.6	179
SSN2-8	1-SMELTER	Soil	smelter		6/24/2006	12:32	mg/kg	155	74.0	1007	33.1 U	27.2 U	392
SSN29	1 SMELTER	Soil	smelter		6/27/2006	8:22	mg/kg	56 U	8.8 U	904	23.9 U	23.2	123
SSN30	1 SMELTER	Soil	smelter		6/27/2006	8:30	mg/kg	57 U	11.8 U	986	25.1 U	29.7	345
SSN31	1 SMELTER	Soil	smelter		6/27/2006	8:39	mg/kg	56 U	12.0 U	1375	25.3 U	56.4	266
SSN3-1	1-SMELTER	Soil	smelter		6/24/2006	12:43	mg/kg	48 U	6.8 U	1065	22.2 U	40.0	135
SSN32	1 SMELTER	Soil	smelter		6/27/2006	8:49	mg/kg	63 U	14.0	1310	27.5 U	30.8	322
SSN33-1	Well MW-10	Soil	smelter		6/22/2006	12:03	mg/kg	90	7.3 U	1018	25.9 U	24.1 U	96 U
SSN33-4	Well MW-10	Soil	smelter		6/22/2006	12:12	mg/kg	64 U	8.5 U	3897	27.2 U	123.9	70
SSN33-8	Well MW-10	Soil	smelter		6/22/2006	12:22	mg/kg	61 U	9.8	3038	25.0 U	84.1	163
SSN3-4	1-SMELTER	soil	smelter		6/24/2006	12:53	mg/kg	54 U	15.2	907	26.5 U	32.1	89 U
SSN3-8	1-SMELTER	Soil	smelter		6/24/2006	13:06	mg/kg	70 U	49.3	669	34.9 U	25.4 U	146 U
SSN4-1	1-SMELTER	Soil	smelter		6/24/2006	13:22	mg/kg	54 U	22.6 U	760	24.2 U	22.9	106 U
SSN4-4	1-SMELTER	Soil	smelter		6/24/2006	13:39	mg/kg	57 U	18.5 U	812	25.4 U	38.8	105 U
SSN4-8	1-SMELTER	Soil	smelter		6/24/2006	13:48	mg/kg	61 U	20.4	595	26.9 U	21.8 U	145
SSN5-1	1-SMELTER	Soil	smelter		6/24/2006	13:57	mg/kg	57 U	38.3	1317	28.3 U	38.6	174
SSN5-4	1-SMELTER	Soil	smelter		6/24/2006	14:17	mg/kg	70 U	31.9	4728	33.9 U	125.8	165
SSN5-8	1-SMELTER	Soil	smelter		6/24/2006	14:26	mg/kg	105	107.8	15850	52.1 U	102.1	673
SSN6-1	1-SMELTER	Soil	smelter		6/24/2006	14:37	mg/kg	51 U	8.3 U	862	23.9 U	44.0	85
SSN6-4	1-SMELTER	Soil	smelter		6/24/2006	14:46	mg/kg	57 U	11.2 U	774	24.7 U	39.5	101 U
SSN6-8	1-SMELTER	Soil	smelter		6/24/2006	14:54	mg/kg	54 U	7.0 U	842	22.5 U	22.2 U	92 U
SSN7-4	1-SMELTER	soil	smelter		6/24/2006	15:17	mg/kg	98	8.4 U	587	27.2 U	23.1 U	149
SSN7-8	1-SMELTER	Soil	smelter		6/24/2006	15:05	mg/kg	54 U	7.4 U	778	24.2 U	23.6	84 U
SSN7-8	1-SMELTER	Soil	smelter		6/24/2006	15:26	mg/kg	55 U	16.8 U	842	24.6 U	34.1	104 U

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XRF ID PRGr TTLC	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q 31 500	As Q 22 500	Ba Q 5,400 10,000	Cd Q 37 100	Cs Q	Cr Q 210 2500
SSN8-1	1 SMELTER	Soil	smelter		6/29/2006	16:50	mg/kg	48 U	7.3 U	1524	22.3 U	58.8	86 U
SSN8-4	1 SMELTER	Soil	smelter		6/29/2006	16:59	mg/kg	53 U	18.4 U	1103	23.8 U	41.5	155
SSN8-8	1 SMELTER	Soil	smelter		6/29/2006	17:09	mg/kg	71 U	87.2	922	30.4 U	25.3 U	370
SSN9-1	Well MW-12	Soil	smelter		6/22/2006	9:31	mg/kg	65 U	9.4	2829	27.5 U	76.1	271
SSN9-4	Well MW-12	Soil	smelter		6/22/2006	10:08	mg/kg	54 U	8.5 U	1746	24.3 U	47.1	166
SSN9-8	Well MW-12	Soil	smelter		6/22/2006	10:17	mg/kg	69 U	6.0 U	8065	28.9 U	201.8	128
SWF1	1 SMELTER	Waste	smelter		6/26/2006	16:42	mg/kg	68	4.8 U	324	30.1 U	21.5 U	63 U
SWF2	1 SMELTER	Waste	smelter		6/26/2006	16:52	mg/kg	61 U	4.9 U	201	28.6 U	23.0	63 U
SWF3	1 SMELTER	Waste	smelter		6/26/2006	17:02	mg/kg	59 U	4.8 U	117	23.0 U	18.6 U	61 U
SWF4	1 SMELTER	Waste	smelter		6/26/2006	17:11	mg/kg	57 U	4.7 U	226	26.2 U	20.1 U	56 U
SWF5	1 SMELTER	Waste	smelter		6/26/2006	17:19	mg/kg	58 U	5.2 U	940	25.5 U	26.3	69 U
SSN34	3 WD	waste	WDA		6/22/2006	12:31	mg/kg	56 U	10.7 U	2724	25.8 U	75.9	180
SSN35-2	3 WD	waste	WDA		6/22/2006	12:40	mg/kg	63 U	8.8 U	3663	29.0 U	76.3	141
SSN36	3 WD	waste	WDA		6/22/2006	12:57	mg/kg	64 U	17.1 U	355	28.7 U	22.4 U	222
SSN37-2	3 WD	waste	WDA		6/22/2006	13:05	mg/kg	62 U	6.1 U	2218	27.1 U	58.6	113
SSN38-2	3 WD	waste	WDA		6/22/2006	13:14	mg/kg	67	11.0 U	4549	28.1 U	166.3	217
SSN39	3 WD	waste	WDA		6/22/2006	13:34	mg/kg	57 U	10.4 U	4419	25.9 U	175.8	275
SSN40	3 WD	waste	WDA		6/22/2006	13:44	mg/kg	88	12.5	4674	26.7 U	157.5	221
SSN41	3 WD	waste	WDA		6/22/2006	13:52	mg/kg	90	4.2 U	4018	30.2 U	109.4	56 U
SSN42	3 WD	waste	WDA		6/22/2006	14:01	mg/kg	64 U	7.7 U	3255	29.7 U	96.0	111
SSN43	3 WD	waste	WDA		6/22/2006	14:10	mg/kg	58 U	7.7 U	1180	22.0 U	37.9	101 U
SSN44	3 WD	waste	WDA		6/22/2006	14:19	mg/kg	68 U	9.8 U	2317	36.0 U	46.2	405
SSN45	3 WD	waste	WDA		6/22/2006	14:28	mg/kg	56 U	3.4 U	254	24.1 U	19.9 U	42 U
SSN46	3 WD	waste	WDA		6/22/2006	14:36	mg/kg	94	6.7 U	3983	25.0 U	104.4	103
SSN47	3 WD	waste	WDA		6/22/2006	14:46	mg/kg	59 U	8.1 U	299	27.4 U	20.0 U	68 U
SSN48	3 WD	waste	WDA		6/22/2006	14:56	mg/kg	73	6.7 U	3415	28.0 U	101.8	124
SSN49	3 WD	waste	WDA		6/22/2006	17:02	mg/kg	102 U	5.9 U	35958	44.8 U	826.1	642
SSN50	3 WD	waste	WDA		6/22/2006	17:11	mg/kg	58 U	8.4 U	3920	26.5 U	117.4	323
SSN51	3 WD	waste	WDA		6/22/2006	17:19	mg/kg	63 U	11.6 U	2943	30.4 U	102.1	637
SSN52	3 WD	waste	WDA		6/22/2006	17:29	mg/kg	59 U	15.6 U	669	24.6 U	33.9	189
SW1-1-10	2 WMU	Waste	WMU1		6/25/2006	12:33	mg/kg	59 U	9.4 U	3533	27.1 U	123.3	134
SW1-1-15	2 WMU	Waste	WMU1		6/25/2006	12:41	mg/kg	62 U	8.8 U	4543	29.1 U	172.5	113
SW1-1-20	2 WMU	Waste	WMU1		6/25/2006	12:50	mg/kg	61 U	9.7 U	7252	28.6 U	279.9	200
SW1-1-4	2 WMU	Waste	WMU1		6/25/2006	12:22	mg/kg	106	9.0 U	5002	31.5 U	185.2	117
SW1-2-10	2 WMU	Waste	WMU1		6/26/2006	10:21	mg/kg	57 U	12.7 U	3066	25.6 U	106.8	186
SW1-2-15	2 WMU	Waste	WMU1		6/26/2006	10:30	mg/kg	54 U	12.6 U	582	25.5 U	24.2	208
SW1-2-20	2 WMU	Waste	WMU1		6/26/2006	10:39	mg/kg	47 U	6.6 U	868	20.8 U	42.4	110
SW1-2-5	2 WMU	Waste	WMU1		6/26/2006	10:12	mg/kg	61 U	12.1 U	4609	28.6 U	177.2	185
SW1-3-10	2 WMU	Waste	WMU1		6/26/2006	10:58	mg/kg	69	14.5 U	1980	27.6 U	64.5	168
SW1-3-15	2 WMU	Waste	WMU1		6/26/2006	11:07	mg/kg	127	12.0 U	1334	26.8 U	26.6 U	90
SW1-3-20	2 WMU	Waste	WMU1		6/26/2006	11:16	mg/kg	58 U	10.7 U	665	25.4 U	29.3	113
SW1-3-5	2 WMU	Waste	WMU1		6/26/2006	10:48	mg/kg	85	9.7 U	6916	28.6 U	237.5	133
SW1-4-10	2 WMU	Waste	WMU1		6/26/2006	11:35	mg/kg	109	13.7 U	2320	26.8 U	71.9	204
SW1-4-15	2 WMU	Waste	WMU1		6/26/2006	11:54	mg/kg	57 U	13.8	1056	26.7 U	26.9	145
SW1-4-20	2 WMU	Waste	WMU1		6/26/2006	12:03	mg/kg	93	7.7 U	383	26.7 U	21.0 U	52 U

XRF Data Halaco Engineering, Company IA

XRF ID	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q	As Q	Ba Q	Cd Q	Cs Q	Cr Q
PRGr								31	22	5,400	37		210
TTLc								500	500	10,000	100		2500
SW1-4-5	2 WMU	Waste	WMU1		6/26/2006	11:26	mg/kg	68 U	10.0	8796	31.4 U	287.7	133
SW1-5-10	2 WMU	Waste	WMU1		6/26/2006	12:21	mg/kg	70	12.2 U	3372	27.8 U	98.0	128
SW1-5-15	2 WMU	Waste	WMU1		6/26/2006	12:31	mg/kg	53 U	11.7 U	1874	26.4	76.0	134
SW1-5-20	2 WMU	Waste	WMU1		6/26/2006	12:39	mg/kg	127	8.5 U	10939	33.4 U	330.1	257
SW1-5-5	2 WMU	Waste	WMU1		6/26/2006	12:12	mg/kg	139	17.5	6790	31.5 U	241.4	116
SW1-6-10	2 WMU	Waste	WMU1		6/26/2006	13:03	mg/kg	60 U	10.7 U	5599	27.3 U	164.3	173
SW1-6-15	2 WMU	Waste	WMU1		6/26/2006	13:17	mg/kg	60 U	15.4	3407	25.4 U	121.1	165
SW1-6-20	2 WMU	Waste	WMU1		6/26/2006	13:26	mg/kg	61 U	11.4	3199	24.7 U	141.8	217
SW1-6-5	2 WMU	Waste	WMU1		6/26/2006	12:54	mg/kg	79	13.7	4609	27.2 U	170.8	182
SW1-7-10	2 WMU	Waste	WMU1		6/26/2006	14:18	mg/kg	57 U	13.2 U	2265	24.5 U	88.2	258
SW1-7-15	2 WMU	Waste	WMU1		6/26/2006	14:28	mg/kg	63 U	12.6	3818	25.5 U	131.3	101
SW1-7-20	2 WMU	Waste	WMU1		6/26/2006	14:39	mg/kg	71 U	8.6	10641	32.0 U	392.8	135
SW1-7-5	2 WMU	Waste	WMU1		6/26/2006	14:09	mg/kg	83	9.7 U	4303	28.5 U	146.1	148
SW2-1-10	2 WMU	Waste	WMU2		6/24/2006	16:53	mg/kg	51 U	10.3 U	689	21.1 U	34.9	203
SW2-1-15	2 WMU	Waste	WMU2		6/24/2006	17:23	mg/kg	49 U	18.6	515	23.5 U	19.6 U	279
SW2-1-20	2 WMU	Waste	WMU2		6/25/2006	8:37	mg/kg	55 U	6.7 U	736	23.2 U	28.2	144
SW2-1-5	2 WMU	Waste	WMU2		6/24/2006	16:43	mg/kg	59 U	11.2 U	4159	25.6 U	137.0	169
SW2-2-10	2 WMU	Waste	WMU2		6/24/2006	17:38	mg/kg	56 U	12.0 U	1130	24.0 U	46.7	206
SW2-2-15	2 WMU	Waste	WMU2		6/24/2006	17:02	mg/kg	58 U	11.7 U	842	24.9 U	31.0	208
SW2-2-20	2 WMU	Waste	WMU2		6/24/2006	17:14	mg/kg	58	6.6 U	782	23.3 U	28.1	149
SW2-2-5	2 WMU	Waste	WMU2		6/24/2006	16:33	mg/kg	56 U	11.2 U	3645	25.8 U	134.2	158
SW2-3-10	2 WMU	Waste	WMU2		6/25/2006	8:54	mg/kg	57 U	11.4 U	2178	28.0 U	79.5	185
SW2-3-15	2 WMU	Waste	WMU2		6/25/2006	9:04	mg/kg	76	9.3 U	11490	32.0 U	379.2	333
SW2-3-20	2 WMU	Waste	WMU2		6/25/2006	9:13	mg/kg	57	8.9 U	357	25.5 U	20.1 U	186
SW2-3-5	2 WMU	Waste	WMU2		6/25/2006	8:46	mg/kg	59 U	9.9 U	4068	26.7 U	138.1	119
SW2-4-10	2 WMU	Waste	WMU2		6/25/2006	9:31	mg/kg	83	10.3 U	6106	29.2 U	192.8	196
SW2-4-15	2 WMU	Waste	WMU2		6/25/2006	9:39	mg/kg	55 U	16.8	1470	24.1 U	66.4	121
SW2-4-20	2 WMU	Waste	WMU2		6/25/2006	9:48	mg/kg	57 U	19.9	1261	33.4	54.7	122
SW2-4-5	2 WMU	Waste	WMU2		6/25/2006	9:22	mg/kg	66 U	14.8	6511	29.5 U	213.9	153
SW2-5-10	2 WMU	Waste	WMU2		6/25/2006	10:16	mg/kg	128	11.0	4492	29.7 U	124.7	142
SW2-5-15	2 WMU	Waste	WMU2		6/25/2006	10:36	mg/kg	61 U	12.1 U	2144	27.9 U	62.7	198
SW2-5-20	2 WMU	Waste	WMU2		6/25/2006	10:45	mg/kg	55 U	10.2	360	24.2 U	22.3	55 U
SW2-5-5	2 WMU	Waste	WMU2		6/25/2006	9:57	mg/kg	117	12.3	4277	28.6 U	121.8	143
SW2-6-10	2 WMU	Waste	WMU2		6/25/2006	11:02	mg/kg	56 U	17.6	788	24.1 U	21.8 U	119
SW2-6-15	2 WMU	Waste	WMU2		6/25/2006	11:11	mg/kg	55 U	10.0 U	604	25.4 U	37.8	135
SW2-6-20	2 WMU	Waste	WMU2		6/25/2006	11:19	mg/kg	56 U	9.9 U	472	24.7 U	20.5 U	208
SW2-6-5	2 WMU	Waste	WMU2		6/25/2006	10:53	mg/kg	57 U	9.6	1947	31.8	79.0	132
SW2-7-10	2 WMU	Waste	WMU2		6/25/2006	11:37	mg/kg	80	9.8 U	2522	26.5 U	83.5	111
SW2-7-15	2 WMU	Waste	WMU2		6/25/2006	11:53	mg/kg	52 U	9.1 U	650	24.8 U	43.4	166
SW2-7-20	2 WMU	Waste	WMU2		6/25/2006	12:13	mg/kg	54 U	9.1 U	323	24.5 U	18.9 U	146
SW2-7-5	2 WMU	Waste	WMU2		6/25/2006	11:28	mg/kg	62 U	10.1 U	2797	27.5 U	83.9	128
SW3-1-10	2 WMU	Waste	WMU3		6/28/2006	16:38	mg/kg	86 U	9.8 U	18074	42.2 U	529.1	880
SW3-1-15	2 WMU	Waste	WMU3		6/28/2006	16:46	mg/kg	160	8.3 U	11378	37.7 U	214.9	216
SW3-1-20	2 WMU	Waste	WMU3		6/28/2006	16:55	mg/kg	111 U	15.3	39667	53.1 U	924.2	584
SW3-1-5	2 WMU	Waste	WMU3		6/28/2006	16:29	mg/kg	64 U	9.4 U	3550	27.0 U	125.3	186

XRF Data Halaco Engineering, Company IA

XRF ID	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q	As Q	Ba Q	Cd Q	Cs Q	Cr Q
PRGr								31	22	5,400	37		210
TTLc								500	500	10,000	100		2500
SW3-2-10	2 WMU	Waste	WMU3		6/28/2006	17:28	mg/kg	65 U	19.0	4235	28.5 U	132.1	202
SW3-2-15	2 WMU	Waste	WMU3		6/28/2006	17:37	mg/kg	76 U	24.6	5834	32.5 U	141.9	269
SW3-2-20	2 WMU	Waste	WMU3		6/28/2006	17:46	mg/kg	58 U	9.3 U	1145	25.5 U	39.4	107
SW3-2-5	2 WMU	Waste	WMU3		6/28/2006	17:05	mg/kg	64 U	25.3	3164	28.3 U	87.1	327
SW3-3-10	2 WMU	Waste	WMU3		6/29/2006	8:12	mg/kg	70	9.1 U	4199	29.5 U	104.2	175
SW3-3-15	2 WMU	Waste	WMU3		6/29/2006	8:21	mg/kg	176	10.4 U	15304	37.1 U	341.7	340
SW3-3-20	2 WMU	Waste	WMU3		6/29/2006	8:29	mg/kg	173	14.0	12708	38.0 U	255.6	343
SW3-3-5	2 WMU	Waste	WMU3		6/28/2006	17:54	mg/kg	104	9.2 U	12450	35.9 U	281.1	234
SW3-4-10	2 WMU	Waste	WMU3		6/29/2006	8:46	mg/kg	96	8.4 U	16513	37.0 U	438.4	190
SW3-4-15	2 WMU	Waste	WMU3		6/29/2006	8:55	mg/kg	115	8.7 U	26209	44.7 U	668.0	529
SW3-4-20	2 WMU	Waste	WMU3		6/29/2006	9:03	mg/kg	61 U	15.2	6890	28.9 U	200.7	252
SW3-4-5	2 WMU	Waste	WMU3		6/29/2006	8:38	mg/kg	159	11.1 U	11865	41.4 U	237.4	336
SW3-5-10	2 WMU	Waste	WMU3		6/29/2006	9:21	mg/kg	88 U	8.6 U	17010	40.0 U	299.8	340
SW3-5-15	2 WMU	Waste	WMU3		6/29/2006	9:30	mg/kg	96 U	7.2 U	25203	44.3 U	558.2	345
SW3-5-20	2 WMU	Waste	WMU3		6/29/2006	9:47	mg/kg	83 U	15.3	13001	37.6 U	250.6	347
SW3-5-5	2 WMU	Waste	WMU3		6/29/2006	9:12	mg/kg	188	10.4	10540	39.0 U	243.9	222
SW3-6-10	2 WMU	Waste	WMU3		6/29/2006	10:05	mg/kg	75 U	8.5 U	10972	30.5 U	247.6	228
SW3-6-15	2 WMU	Waste	WMU3		6/29/2006	10:14	mg/kg	81 U	11.7	11584	38.3 U	236.7	247
SW3-6-20	2 WMU	Waste	WMU3		6/29/2006	10:23	mg/kg	138	11.1 U	21611	44.3 U	433.0	338
SW3-6-5	2 WMU	Waste	WMU3		6/29/2006	9:57	mg/kg	129	8.3 U	13128	36.8 U	329.0	249
SW3-7-10	2 WMU	Waste	WMU3		6/29/2006	10:40	mg/kg	72 U	11.8 U	12306	32.0 U	379.6	302
SW3-7-15	2 WMU	Waste	WMU3		6/29/2006	10:48	mg/kg	80 U	12.9	10823	35.9 U	253.1	255
SW3-7-20	2 WMU	Waste	WMU3		6/29/2006	10:57	mg/kg	150	13.3	32776	47.1 U	699.6	664
SW3-7-5	2 WMU	Waste	WMU3		6/29/2006	10:31	mg/kg	130	7.1 U	22148	43.8 U	491.4	297
SW4-1-10	2 WMU	Waste	WMU4		6/25/2006	13:12	mg/kg	56 U	9.1 U	1495	25.5 U	60.2	183
SW4-1-15	2 WMU	Waste	WMU4		6/25/2006	13:22	mg/kg	60 U	9.9 U	2139	26.9 U	76.4	96
SW4-1-20	2 WMU	Waste	WMU4		6/25/2006	13:31	mg/kg	102	9.8 U	1603	25.3 U	54.8	148
SW4-1-5	2 WMU	Waste	WMU4		6/25/2006	13:02	mg/kg	80	9.7 U	289	26.3 U	19.9 U	181
SW4-2-10	2 WMU	Waste	WMU4		6/25/2006	14:01	mg/kg	55 U	9.0 U	1732	25.3 U	71.2	108
SW4-2-15	2 WMU	Waste	WMU4		6/25/2006	14:10	mg/kg	56 U	14.1	3826	25.0 U	141.1	154
SW4-2-20	2 WMU	Waste	WMU4		6/25/2006	14:18	mg/kg	79	10.1 U	5733	31.6 U	133.1	169
SW4-2-5	2 WMU	Waste	WMU4		6/25/2006	13:40	mg/kg	62 U	14.5 U	407	26.7 U	21.9 U	344
SW4-3-10	2 WMU	Waste	WMU4		6/25/2006	15:15	mg/kg	80	7.5 U	4250	28.8 U	94.1	134
SW4-3-15	2 WMU	Waste	WMU4		6/25/2006	15:23	mg/kg	89	7.0 U	6703	29.9 U	189.8	144
SW4-3-20	2 WMU	Waste	WMU4		6/25/2006	15:43	mg/kg	62 U	9.4 U	3487	27.2 U	108.8	166
SW4-3-5	2 WMU	Waste	WMU4		6/25/2006	15:05	mg/kg	177	6.9 U	22625	41.3 U	601.4	345
SW4-4-10	2 WMU	Waste	WMU4		6/25/2006	14:37	mg/kg	82 U	8.7 U	15393	38.2 U	395.7	368
SW4-4-15	2 WMU	Waste	WMU4		6/25/2006	14:46	mg/kg	95	6.7 U	14826	34.1 U	442.4	350
SW4-4-20	2 WMU	Waste	WMU4		6/25/2006	14:55	mg/kg	57 U	11.0	2373	24.5 U	99.0	136
SW4-4-5	2 WMU	Waste	WMU4		6/25/2006	14:27	mg/kg	151	8.0 U	9023	36.2 U	206.3	162
SW4-5-10	2 WMU	Waste	WMU4		6/25/2006	16:02	mg/kg	64 U	8.3 U	7285	29.3 U	241.9	168
SW4-5-15	2 WMU	Waste	WMU4		6/25/2006	16:15	mg/kg	53 U	8.7 U	1497	25.9 U	61.8	111
SW4-5-20	2 WMU	Waste	WMU4		6/25/2006	16:23	mg/kg	138	17.9	2307	32.7 U	40.0	105
SW4-5-5	2 WMU	Waste	WMU4		6/25/2006	15:53	mg/kg	69 U	7.2 U	5166	27.6 U	133.6	123
SW5-1-10	2 WMU	Waste	WMU5		6/27/2006	9:08	mg/kg	63 U	17.1 U	7197	28.4 U	205.8	199

XRF Data Halaco Engineering, Company IA

XRF ID	LOCATION	matrix	Area	BKG?	Date	Time	Units	An Q	As Q	Ba Q	Cd Q	Cs Q	Cr Q
PRGr								31	22	5,400	37		210
TTLc								500	500	10,000	100		2500
SW5-1-15	2 WMU	Waste	WMU5		6/27/2006	9:17	mg/kg	71 U	10.4	2093	31.3 U	47.0	115
SW5-1-20	2 WMU	Waste	WMU5		6/27/2006	9:26	mg/kg	130	8.5 U	6152	27.5 U	152.0	107
SW5-1-5	2 WMU	Waste	WMU5		6/27/2006	8:59	mg/kg	109	16.2 U	1065	28.3 U	26.2 U	476
SW5-2-10	2 WMU	Waste	WMU5		6/27/2006	9:44	mg/kg	65 U	5.5 U	7842	27.3 U	229.3	175
SW5-2-15	2 WMU	Waste	WMU5		6/27/2006	10:08	mg/kg	51 U	8.0 U	1110	24.8 U	59.6	72
SW5-2-20	2 WMU	Waste	WMU5		6/27/2006	10:18	mg/kg	62 U	9.0	3617	29.4 U	131.1	123
SW5-2-5	2 WMU	Waste	WMU5		6/27/2006	9:35	mg/kg	57 U	5.7 U	2282	27.9 U	75.4	59 U
SW5-3-10	2 WMU	Waste	WMU5		6/27/2006	10:40	mg/kg	65 U	8.3 U	3761	30.9 U	137.0	110
SW5-3-15	2 WMU	Waste	WMU5		6/27/2006	10:49	mg/kg	116	9.9 U	2770	27.1 U	104.1	114
SW5-3-20	2 WMU	Waste	WMU5		6/27/2006	10:58	mg/kg	74	14.0 U	2328	31.7 U	51.6	285
SW5-3-5	2 WMU	Waste	WMU5		6/27/2006	10:28	mg/kg	222	6.9 U	7715	32.7 U	168.4	151
SW5-4-10	2 WMU	Waste	WMU5		6/27/2006	11:22	mg/kg	83	9.7 U	2744	33.2 U	71.3	114
SW5-4-15	2 WMU	Waste	WMU5		6/27/2006	11:31	mg/kg	85	13.9	5823	31.8 U	144.7	255
SW5-4-20	2 WMU	Waste	WMU5		6/27/2006	11:40	mg/kg	54 U	9.5	545	25.1 U	20.0 U	81
SW5-4-5	2 WMU	Waste	WMU5		6/27/2006	11:07	mg/kg	152	7.8 U	18945	41.4 U	486.8	334
SW5-5-10	2 WMU	Waste	WMU5		6/27/2006	14:14	mg/kg	196	15.6 U	3404	32.9 U	76.2	193
SW5-5-15	2 WMU	Waste	WMU5		6/27/2006	14:22	mg/kg	152	23.2	9218	41.9 U	111.8	353
SW5-5-20	2 WMU	Waste	WMU5		6/27/2006	14:31	mg/kg	101	17.8	15122	41.4 U	268.0	382
SW5-5-5	2 WMU	Waste	WMU5		6/27/2006	14:05	mg/kg	100 U	8.5 U	29784	47.6 U	661.5	480
SW5-6-10	2 WMU	Waste	WMU5		6/27/2006	14:49	mg/kg	69 U	20.9	4283	33.2	114.1	195
SW5-6-15	2 WMU	Waste	WMU5		6/27/2006	14:59	mg/kg	74 U	25.3	2362	31.9 U	77.6	169
SW5-6-20	2 WMU	Waste	WMU5		6/27/2006	15:11	mg/kg	113	28.6	4975	32.6 U	103.7	220
SW5-6-5	2 WMU	Waste	WMU5		6/27/2006	14:40	mg/kg	123 U	12.9	48316	59.9 U	946.6	790
SW5-7-10	2 WMU	Waste	WMU5		6/27/2006	15:32	mg/kg	179	19.7	1675	36.5 U	32.3 U	240
SW5-7-15	2 WMU	Waste	WMU5		6/27/2006	15:51	mg/kg	68 U	18.0	2916	32.3 U	66.6	164
SW5-7-20	2 WMU	Waste	WMU5		6/27/2006	16:01	mg/kg	69 U	19.5	4519	29.4 U	96.9	191
SW5-7-5	2 WMU	Waste	WMU5		6/27/2006	15:23	mg/kg	58 U	13.5	2617	28.1 U	75.8	71

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLc	8000	2500		1000		3500	2000	100	500	5,000
SBD31	55 U	64	3226	12.2	106	1.4 U	66 U	7.3 U	125	34 U
SBD32	66 U	78	5278	8.1	142	1.6 U	67 U	7.4 U	103 U	34 U
SBD33	63 U	51	4966	15.2	174	1.5 U	67 U	7.3 U	104 U	34 U
SBD34	57 U	46 U	4082	15.3	168	1.4 U	65 U	7.1 U	102 U	34 U
SDB35	64 U	76	5188	9.5	206	1.6 U	65 U	7.4 U	173	34 U
SDB36	55 U	66	3107	12.5	76	1.3 U	66 U	7.1 U	104 U	34 U
SBD22	68 U	74	5563	16.6	150	1.6 U	68 U	7.6 U	107 U	35 U
SBD23	199 U	149	45185	26.3	1458	6.9	104 U	14.6	122 U	53 U
SBD24	193 U	108	46805	28.8	1419	4.2 U	96 U	10.9	240	49 U
SBD25	112 U	59	17721	15.3	576	2.9 U	77 U	8.4 U	106 U	40 U
SBD26	141 U	89	25753	25.2	878	5.6	98	9.3 U	110 U	45 U
SBD30	96 U	53 U	12714	18.2	381	2.4	76 U	8.3 U	143	39 U
SDB1	54 U	73	3016	19.2	134	1.3 U	66 U	7.3 U	102 U	34 U
SDB10	56 U	47	3544	13.0	150	1.4 U	66 U	7.1 U	104 U	33 U
SDB11	78 U	66	8843	14.1	245	1.7 U	69 U	7.5 U	104 U	36 U
SDB12	99 U	68	14674	13.6	306	2.3	72 U	7.9 U	108 U	37 U
SDB13	60 U	47 U	4694	11.8	128	1.3 U	66 U	7.2 U	104 U	34 U
SDB14	64 U	72	5136	12.9	189	1.5 U	66 U	7.3 U	102 U	34 U
SDB15	61 U	65	4535	13.1	108	1.4 U	65 U	7.3 U	105 U	34 U
SDB16	57 U	57	3563	8.6	144	1.5 U	67 U	7.2 U	105 U	34 U
SDB17	152 U	106	30070	24.3	1039	3.9 U	90 U	12.3	109 U	46 U
SDB18	166 U	121	34222	24.0	1160	5.9	95 U	10.9	220	48 U
SDB19	62 U	77	4653	13.5	189	1.6 U	66 U	7.4 U	107 U	34 U
SDB2	54 U	62	3195	15.7	67 U	1.3 U	66 U	7.1 U	106 U	34 U
SDB20	189 U	129	44249	18.2	1429	4.8 U	98 U	10.5 U	115 U	51 U
SDB21	136 U	103	24714	25.4	798	3.5 U	86 U	9.1 U	138	44 U
SDB3	75 U	52	7908	9.8	326	1.8 U	70 U	7.5 U	104 U	35 U
SDB4	82 U	56	10252	13.3	257	1.9 U	69 U	7.5 U	104 U	35 U
SDB5	75 U	63	7533	16.2	240	1.8 U	69 U	7.5 U	106 U	36 U
SDB6	63 U	47 U	5194	19.3	141	1.4 U	66 U	7.1 U	103 U	34 U
SDB7	67 U	109	6237	14.2	178	1.6 U	66 U	7.4 U	104 U	34 U
SDB8	76 U	72	7954	11.8	219	1.8 U	69 U	7.6 U	103 U	36 U
SDB9	66 U	47 U	6023	9.6	155	1.5 U	67 U	7.3 U	128	34 U
SDM 3	95 U	63	12154	18.3	257	2.4 U	77 U	8.4 U	111 U	40 U
SDM1	99 U	89	13019	29.4	307	2.7 U	79 U	8.5 U	109 U	41 U
SDM2	93 U	54	11529	23.4	225	2.0 U	75 U	8.1 U	109 U	40 U
SDM4	96 U	66	11960	19.1	286	2.5 U	77 U	8.4 U	111 U	41 U
SDM5	92 U	61	10956	18.4	322	2.2 U	76 U	8.3 U	109 U	40 U
SDM6	95 U	54 U	11822	21.3	237	2.2 U	77 U	8.5 U	113 U	40 U
SDM7	91 U	108	11058	21.9	219	2.4 U	75 U	8.2 U	112 U	40 U
SDM8	93 U	67	11151	20.4	205	3.2	77 U	8.3 U	109 U	40 U
SDM10	89 U	112	10823	23.5	249	1.8 U	75 U	8.2 U	106 U	39 U
SDM11	98 U	54 U	12828	22.9	277	2.3 U	77 U	8.5 U	153	41 U
SDM12	86 U	53 U	9772	19.0	202	2.1 U	75 U	8.2 U	114 U	39 U
SDM13	83 U	62	9230	22.7	160	1.6 U	73 U	8.0 U	110 U	38 U

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLc	8000	2500		1000		3500	2000	100	500	5,000
SDM14	90 U	53 U	10335	18.0	230	2.7	75 U	10.0	215	39 U
SDM15	92 U	64	11026	22.4	254	2.0 U	76 U	8.2 U	107 U	39 U
SDM16	96 U	94	12211	22.2	269	2.2 U	78 U	8.5 U	108 U	40 U
SDM17	90 U	73	10620	22.7	253	2.0 U	76 U	8.2 U	110 U	40 U
SDM18	89 U	68	10048	20.0	240	1.9 U	75 U	7.9 U	109 U	39 U
SDM19	81 U	51 U	8804	19.3	142	1.4 U	73 U	7.9 U	110 U	38 U
SDM20	81 U	51 U	8501	22.4	215	1.4 U	72 U	7.9 U	107 U	38 U
SDM21	77 U	63	7585	20.7	159	1.5 U	72 U	7.8 U	106 U	38 U
SDM22	85 U	61	9450	17.8	244	2.0 U	75 U	8.2 U	109 U	38 U
SDM23	71 U	90	6241	19.9	159	1.4 U	70 U	7.8 U	155	37 U
SDM24	84 U	66	8929	22.9	244	1.8 U	74 U	7.9 U	207	39 U
SDM25	74 U	63	7330	17.7	208	1.4 U	70 U	7.6 U	111 U	37 U
SDM26	75 U	92	6836	18.5	186	2.1	74 U	9.2	107 U	38 U
SDM27	85 U	54	9183	16.7	279	1.8 U	74 U	8.0 U	109 U	38 U
SDM9	95 U	58	11941	20.3	199	3.4	77 U	8.3 U	113 U	40 U
SDF1	165 U	132	33978	26.3	353	7.1	92 U	10.2	132 U	50
SDF2	65 U	78	4851	19.1	176	1.4 U	70 U	7.8 U	106 U	38 U
SDF3	105 U	314	14089	59.4	493	1.8	82 U	8.8 U	128 U	608
SDF4	118 U	141	18259	30.3	585	3.1 U	81 U	8.7 U	114 U	43 U
SDF5	117 U	246	18507	34.8	626	2.1	79 U	8.5 U	125 U	168
SDF6	89 U	137	10615	25.4	370	2.7	76 U	8.2 U	129 U	78
SWL31	82 U	129	9666	52.3	349	1.5 U	70 U	7.6 U	168	155
SWL32	84 U	63	9978	26.4	411	1.5 U	71 U	7.6 U	118	37 U
SWL33	74 U	76	7189	15.9	173	1.5 U	69 U	7.5 U	150	36 U
SWL34	100 U	97	14051	42.2	430	1.7 U	76 U	8.2 U	116 U	40 U
SWL34DUP	100 U	90	14275	45.3	511	1.7 U	77 U	8.3 U	116 U	62
SWL35	87 U	52	10870	37.7	266	1.6 U	70 U	7.7 U	119 U	37 U
SWL36	90 U	73	11381	39.8	373	1.6 U	73 U	7.8 U	108 U	48
SWL1	83 U	2942	7762	276.1	2671	6.9	117	12.5	120 U	3891
SWL10	78 U	1871	8774	157.5	959	3.9	69 U	7.4 U	127 U	1533
SWL11	77 U	1350	8415	137.6	962	2.3	69 U	7.4 U	113 U	1218
SWL12	59 U	1077	5401	124.9	546	2.8	75	6.4 U	133 U	1011
SWL13	80 U	2437	9501	265.8	825	6.3	141	7.5 U	121 U	2031
SWL14	78 U	1330	8589	134.9	644	2.0	69 U	8.5	113 U	1071
SWL15	74 U	1070	7576	124.8	535	2.2	69 U	7.4 U	111 U	879
SWL16	82 U	3171	9427	370.3	1014	6.9	130	7.5 U	124 U	2541
SWL17	84 U	3142	9792	344.3	1014	7.5	165	7.8 U	114 U	2402
SWL18	82 U	2863	9656	294.2	1038	6.9	105	8.4	117 U	2279
SWL19	83 U	4913	9114	438.6	1403	6.9	147	9.6	133 U	3996
SWL2	79 U	2102	9190	197.7	1273	6.3	84	7.9	110 U	1809
SWL20	75 U	1720	7812	133.3	578	4.4	69 U	7.5 U	133	1357
SWL21	79 U	5124	8247	519.5	1965	14.6	194	7.7 U	126 U	4954
SWL22	74 U	2889	6318	349.5	1699	8.0	116	16.9	142 U	2853
SWL23	73 U	1932	5251	213.8	2273	4.8	82 U	10.6	141 U	2410
SWL24	92 U	442	12389	82.9	717	2.7	70 U	8.5	113 U	574

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLc	8000	2500		1000		3500	2000	100	500	5,000
SWL25	92 U	714	12494	93.4	715	2.1	71 U	7.7 U	116 U	756
SWL26	68 U	657	7934	46.7	2626	2.1	58 U	6.3 U	110 U	655
SWL27	106 U	806	16041	89.7	929	3.2	75 U	8.0 U	159	878
SWL28	83 U	145	10129	54.5	382	1.6 U	67 U	11.3	123 U	207
SWL29	99 U	86	14004	23.0	299	1.6 U	74 U	8.0 U	290	64
SWL3	79 U	2778	8298	253.8	1845	5.8	93	7.8 U	139	2480
SWL4	77 U	1142	7237	166.3	746	2.9	74 U	8.0 U	115 U	1036
SWL5	78 U	2859	7788	312.4	1239	7.1	152	8.0 U	123 U	2036
SWL6	76 U	1413	7639	139.5	616	3.0	72 U	7.8 U	123 U	1123
SWL7	85 U	926	10041	93.5	749	3.7	71 U	7.7 U	115 U	736
SWL8	100 U	1094	14194	113.7	890	2.1 U	76 U	8.2 U	127	820
SWL9	83 U	1828	10303	212.3	668	3.8	96	7.3 U	128 U	1693
R-1	27 U	35 U	60 U	5.2 U	208	0.9 U	50 U	5.5 U	147 U	41
SSA1	94 U	64	12358	18.8	280	1.9 U	74 U	8.1 U	122 U	39 U
SSA10	109 U	89	17400	22.6	345	1.8 U	75 U	8.0 U	115 U	43
SSA2	97 U	64	13422	22.0	305	1.8 U	74 U	8.0 U	111 U	39 U
SSA3	94 U	51 U	12049	26.0	290	1.7 U	72 U	7.8 U	124	38 U
SSA4	95 U	107	13244	18.9	251	1.7 U	72 U	7.7 U	124 U	38 U
SSA5	96 U	51 U	13529	23.9	259	2.2	73 U	7.9 U	123 U	51
SSA6	108 U	55	16925	24.2	281	1.7 U	75 U	8.1 U	114 U	39 U
SSA7	110 U	82	17426	22.9	370	1.7 U	74 U	8.2 U	118 U	39 U
SSA8	109 U	54	17307	32.0	355	1.9	76 U	8.0 U	119 U	40 U
SSA9	132	77	18385	24.3	395	1.8 U	76 U	8.2 U	143	43
SSN94	181 U	108	38620	20.0	508	1.8 U	95 U	13.5	129 U	51 U
SSN95	116 U	98	19609	38.4	384	1.7 U	76 U	8.1 U	123 U	64
SSN96	119 U	55 U	19787	32.2	319	1.7 U	79 U	8.4 U	174	70
SSN97	108 U	99	16482	47.5	180	2.3	75 U	8.2 U	128 U	127
SSN98	128 U	61	22920	30.4	454	2.9	79 U	8.4 U	199	42 U
SSN99	119 U	110	19114	28.3	282	1.7 U	78 U	8.4 U	130 U	66
SSN54	69 U	3016	5944	186.7	3304	10.1	149	11.2	119 U	4136
SSN55	91 U	227	11355	50.9	410	2.0	73 U	8.0 U	118 U	196
SSN56	81 U	211	9052	51.7	490	2.0	71 U	7.6 U	129 U	275
SSN57	102 U	385	13418	80.1	770	2.7	77 U	9.0	130 U	508
SSN58	86 U	920	7413	158.8	1691	5.6	86 U	9.3 U	201	1178
SSN59	86 U	327	10135	52.4	515	2.4	73 U	8.0 U	125 U	298
SSN60	95 U	1610	11757	209.6	1757	6.2	79 U	8.5 U	131 U	1701
SSN61	79 U	1403	8788	118.6	1166	6.5	70 U	7.9	119 U	1976
SSN62	98 U	1258	10535	150.0	1705	6.0	86 U	9.2 U	131 U	1142
SSN63	120 U	629	16961	122.1	1243	3.9	102	13.1	125 U	786
SSN64	92 U	285	11722	59.1	430	1.7 U	73 U	7.8 U	123 U	336
SSN65	135	81	12321	38.1	291	1.8 U	80 U	8.6 U	118 U	43 U
SSN66	96 U	267	11504	54.7	635	1.8 U	78 U	8.4 U	133	136
SSN67	70 U	895	6164	82.1	515	4.2	72 U	7.7 U	118 U	722
SSN68	73 U	912	7146	112.1	671	3.8	70 U	7.6 U	120 U	946
SSN69	67 U	2045	5281	139.6	915	8.7	73 U	8.6	123 U	1736

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLc	8000	2500		1000		3500	2000	100	500	5,000
SSN70	82 U	668	8214	84.8	687	2.0	74 U	8.0 U	125 U	698
SSN71	102 U	175	14459	61.5	351	2.0	73 U	7.9 U	117 U	124
SSN72	102 U	129	13250	32.1	303	2.4	78 U	8.5 U	109 U	42 U
SSN73	104 U	135	14750	36.9	487	1.7 U	76 U	8.1 U	115 U	59
SSN74	61 U	2632	4626	169.3	807	4.8	67 U	7.1 U	118 U	1925
SSN75	90 U	3115	10524	196.8	1885	9.5	551	7.9 U	126 U	4242
SSN76	93 U	118	11097	19.0	255	2.8	77 U	8.4 U	225	41 U
SSN77	95 U	90	11513	28.1	312	2.4	78 U	8.4 U	113 U	41 U
SSN78	102	128	12816	138.8	305	2.4	78 U	8.4 U	112 U	51
SSN79	50	91	1442	11.6	51 U	1.0 U	53 U	5.7 U	207	27 U
SSN79	107 U	180	16410	44.6	558	1.7 U	76 U	8.1 U	120 U	176
SSN80	73 U	1229	7245	206.4	782	3.1	82	7.8 U	119 U	1159
SSN81	88 U	598	9675	113.7	687	2.9	77 U	8.3 U	122 U	754
SSN82	82 U	757	9175	130.9	809	2.1	91	7.8 U	122 U	900
SSN83	114 U	206	17551	51.0	539	1.8 U	81 U	8.7 U	187	203
SSN84	118 U	188	17600	63.1	621	1.9 U	84 U	8.9 U	124 U	205
SSN85	91 U	117	11794	83.3	377	1.6 U	72 U	7.9 U	116 U	404
SSN86	104 U	1330	13349	173.1	1797	7.9	96	8.7 U	133 U	1998
SSN87	78 U	1149	8728	158.7	1016	2.5	85	7.3 U	120 U	1120
SSN88	75 U	1129	7835	119.5	749	2.3	69 U	7.5 U	118 U	1235
SSN89	75 U	1056	8317	106.3	997	1.9	68 U	7.3 U	121 U	1131
SSN90	71 U	1114	6880	153.6	1837	3.4	68 U	9.9	123 U	1090
SSN91	112	1583	14133	189.7	1573	7.0	90	8.6 U	133 U	1437
SSN92	99 U	932	16311	117.3	766	2.6	67 U	7.2 U	117 U	856
SSN93	113 U	1297	18504	190.3	748	4.6	76 U	8.1 U	121 U	1155
SSR1	121 U	99	20637	23.7	447	1.7 U	77 U	8.4 U	195	40 U
SSR10	87 U	60	10875	35.5	311	1.5 U	71 U	8.1	104 U	37 U
SSR2	118 U	60	19504	26.5	413	1.8 U	78 U	8.4 U	113 U	41 U
SSR3	119 U	66	19750	26.2	389	1.7 U	77 U	8.4 U	111 U	41 U
SSR4	120 U	79	20675	29.3	451	1.7 U	78 U	8.4 U	116	41 U
SSR5	123 U	80	21504	28.9	503	1.9	79 U	8.5 U	109 U	43
SSR6	123 U	107	22060	29.0	434	1.7 U	79 U	8.4 U	138	41 U
SSR7	108 U	96	16713	66.5	384	1.8 U	75 U	8.2 U	144	40 U
SSR8	101 U	106	14668	62.8	328	1.7 U	73 U	7.8 U	105 U	39 U
SSR9	105 U	76	15679	80.6	320	1.6 U	74 U	8.0 U	105 U	39 U
SO2	40 U	11048	307	302.4	58 U	1.0 U	247	6.2 U	309	10074
SSN10-1	285 U	436	84971	945.0	1007	3.4	132	12.3 U	129 U	1290
SSN10-4	220 U	441	56666	776.1	752	2.1	158	11.0 U	129 U	1143
SSN10-8	129 U	115	23960	137.7	415	2.0	79 U	8.6 U	112 U	301
SSN1-1	139 U	1478	29238	164.6	8250	2.1	94	8.5 U	124 U	2228
SSN11-1	124 U	97	21089	34.9	289	2.7	80 U	8.6 U	155	62
SSN11-4	87 U	71	10309	25.7	216	1.5 U	73 U	7.9 U	111 U	58
SSN11-8	101 U	81	13067	12.4	290	1.7 U	79 U	8.7 U	131 U	41 U
SSN1-2	138 U	768	23996	776.2	602	1.6 U	87 U	9.5 U	123 U	1276
SSN12-1	101 U	67	14148	15.7	289	1.7 U	75 U	8.5	116 U	39 U

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLc	8000	2500		1000		3500	2000	100	500	5,000
SSN12-4	94 U	72	12778	19.6	199	1.5 U	70 U	7.6 U	115 U	37 U
SSN12-8	133 U	97	23314	22.0	356	1.7 U	83 U	8.8 U	126 U	44 U
SSN13	78 U	1156	9176	168.7	3166	4.0	112	7.3 U	133 U	3109
SSN14	93 U	2479	12755	301.8	2997	6.3	78	7.6 U	226	3762
SSN15	97	1607	13119	181.6	3117	3.9	70 U	7.4 U	132 U	2892
SSN16	119 U	227	19291	26.9	932	1.7 U	80 U	8.7 U	123 U	168
SSN17	95 U	1456	12252	196.5	2236	4.5	74 U	7.8 U	123 U	2111
SSN18	78 U	572	10008	61.0	2675	2.0 U	62 U	6.6 U	122 U	976
SSN1-8	123 U	125	21267	830.8	295	1.6 U	81 U	8.6 U	128	361
SSN19	27 U	125	450	17.8	59	1.1 U	42 U	4.6 U	137 U	89
SSN20	172	757	21569	143.0	2008	3.0	76 U	8.1 U	123 U	1420
SSN21	108 U	159	16039	36.1	568	2.0	78 U	8.5 U	117 U	214
SSN2-1	74	85	2422	71.7	54 U	1.0 U	53 U	5.9 U	138 U	465
SSN2-1DUP	108 U	158	16569	199.8	331	1.6 U	76 U	8.1 U	113 U	2591
SSN22	106 U	227	16852	57.3	885	2.4	75 U	7.9 U	111 U	496
SSN23	160 U	294	32909	84.0	809	13.6	159	9.3 U	122 U	484
SSN24	158 U	239	33463	44.6	689	2.0	86 U	9.1 U	111 U	307
SSN2-4	146 U	486	28924	562.1	451	2.2	190	8.9 U	136	3940
SSN25	201 U	1127	48233	288.3	1506	4.1	339	10.9	119 U	9412
SSN26	157 U	331	32398	53.7	658	1.8 U	87 U	9.3 U	239	1153
SSN27	174 U	1785	40538	189.6	2542	6.1	125	9.2 U	116 U	3483
SSN28	137 U	661	25788	99.0	698	2.1	83 U	8.7 U	116 U	792
SSN2-8	322 U	1941	97600	1655.7	969	6.6	130 U	13.5 U	238	10167
SSN29	132 U	215	25015	70.5	589	2.3	81 U	8.6 U	116 U	467
SSN30	167 U	1137	37892	163.4	1413	5.0	129	9.0 U	123 U	1682
SSN31	156 U	1740	34027	173.4	2358	8.5	109	8.9 U	121 U	2792
SSN3-1	86 U	52 U	9654	23.5	209	1.5 U	74 U	7.9 U	107 U	39 U
SSN32	219 U	1173	59192	185.8	2668	6.2	214	10.0 U	129 U	2528
SSN33-1	123 U	81	19891	21.7	554	1.7 U	82 U	8.8 U	134	43 U
SSN33-4	48 U	780	2612	114.4	1540	2.2	60 U	6.6 U	129 U	907
SSN33-8	56 U	1319	4314	168.6	2050	3.8	60 U	6.4 U	124 U	2140
SSN3-4	100 U	828	13499	197.9	278	1.7	76 U	8.3 U	116 U	550
SSN3-8	283 U	4924	88614	722.2	868	5.1	190	11.4 U	144 U	1454
SSN4-1	153 U	677	30863	761.4	464	1.7 U	86 U	9.5 U	115 U	1275
SSN4-4	154 U	329	29681	481.9	426	1.9	87 U	9.4 U	119 U	1124
SSN4-8	184 U	295	45742	499.7	507	2.4	865	9.3 U	155	857
SSN5-1	212	556	43118	523.4	845	1.9 U	92 U	10.3	122 U	1308
SSN5-4	231 U	505	62054	564.5	795	4.8	102 U	10.6 U	141 U	8844
SSN5-8	591 U	968	241690	2574.2	3384	7.5	183 U	18.8 U	196 U	5405
SSN6-1	92 U	70	11807	72.5	261	1.5 U	72 U	7.9 U	113 U	101
SSN6-4	138 U	196	25827	143.3	389	3.3	84 U	8.9 U	120 U	498
SSN6-8	107 U	94	15633	24.5	281	1.8	78 U	8.4 U	206	41 U
SSN7-4	197	95	45819	32.8	655	5.6	94 U	9.7 U	159	66
SSN7-8	96 U	68	13413	44.1	244	1.5 U	74 U	9.8	113 U	78
SSN7-8	143 U	208	26454	407.5	473	2.0	85 U	9.4 U	114 U	738

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLc	8000	2500		1000		3500	2000	100	500	5,000
SSN8-1	89 U	111	10571	39.7	367	1.6 U	73 U	7.8 U	107 U	3159
SSN8-4	158 U	323	32717	479.3	436	1.8 U	88 U	9.5 U	115 U	931
SSN8-8	481 U	827	191902	1288.5	2075	5.9	151 U	15.7 U	141 U	2639
SSN9-1	93 U	271	10576	60.4	8035	6.3	79 U	8.6 U	134 U	745
SSN9-4	89 U	707	10545	77.1	866	3.0	75 U	7.9 U	118 U	902
SSN9-8	61 U	102	4906	24.6	1745	2.7	64 U	6.9 U	137 U	297
SWF1	46 U	167	2708	8.8	2073	2.8	57 U	6.2 U	233	437
SWF2	43 U	100	2177	8.2	2287	3.6	56 U	6.1 U	128 U	523
SWF3	39 U	146	1283	7.9	1681	1.6 U	55 U	6.1 U	121 U	862
SWF4	42 U	181	2844	18.4	2267	2.3	49 U	5.3 U	121 U	595
SWF5	57 U	131	4399	12.3	4172	4.7	61 U	6.6 U	160	502
SSN34	82 U	2594	10512	201.3	3010	7.8	107	7.0 U	118 U	2487
SSN35-2	65 U	2183	6962	138.0	3107	5.3	117	6.4 U	124 U	2289
SSN36	74 U	10017	6619	555.8	679	12.2	405	7.4 U	127 U	6898
SSN37-2	68 U	372	7394	35.1	3923	3.0	61 U	6.6 U	132 U	641
SSN38-2	73 U	1978	6754	182.0	2401	6.7	116	7.8 U	127 U	1706
SSN39	66 U	1909	6579	185.1	3595	11.4	95	7.8	119 U	1846
SSN40	73 U	2060	7444	223.0	3665	4.9	106	7.2 U	130	2007
SSN41	38 U	141	2208	11.4	3639	1.6 U	47 U	5.1 U	129 U	408
SSN42	83 U	553	10983	68.7	16729	6.0	67 U	7.3 U	131 U	1188
SSN43	128 U	185	20600	28.5	827	2.5	85 U	9.2 U	122 U	88
SSN44	95 U	465	9472	54.0	5741	26.9	94 U	9.9 U	1894	839
SSN45	25 U	61	456	4.4 U	186	0.9 U	39 U	4.4 U	118 U	88
SSN46	61 U	523	6203	59.4	5031	3.9	58 U	6.2 U	260	891
SSN47	54 U	2990	3648	116.5	3503	5.5	82	6.2 U	118 U	4565
SSN48	74 U	438	8700	44.5	6601	4.9	64 U	6.8 U	138	853
SSN49	59 U	214	3717	7.5 U	5843	2.3 U	71 U	7.7 U	201 U	967
SSN50	71 U	1894	8164	119.2	6391	9.3	159	6.7 U	124 U	1871
SSN51	73 U	1618	9343	293.8	3882	12.8	244	6.5 U	124 U	1429
SSN52	62 U	4208	4900	509.1	4423	6.6	91	6.9 U	118 U	3550
SW1-1-10	51 U	1279	3696	175.5	2382	2.3	85	6.0 U	121 U	1190
SW1-1-15	51 U	988	3960	151.8	2202	3.6	55 U	6.0 U	124 U	994
SW1-1-20	50 U	1263	3766	198.7	1444	4.4	55 U	6.0 U	124 U	1052
SW1-1-4	46 U	1060	2959	155.2	2183	3.8	56 U	6.1 U	130 U	992
SW1-2-10	60 U	3185	5183	332.4	1377	5.5	121	6.6 U	114 U	2171
SW1-2-15	72 U	2959	6505	275.7	1137	5.9	80	7.5 U	112 U	2284
SW1-2-20	98 U	79	13716	21.5	320	1.7 U	74 U	7.9 U	108 U	38 U
SW1-2-5	63 U	1971	5995	294.9	2650	4.7	61 U	6.6 U	124 U	1614
SW1-3-10	64 U	3871	5827	444.4	1027	6.7	248	6.7 U	191	2578
SW1-3-15	49 U	2258	3440	331.5	866	5.2	121	9.6	220	1597
SW1-3-20	45 U	1870	3422	289.8	393	4.1	71	5.5 U	122 U	1086
SW1-3-5	52 U	1232	3706	181.1	2966	3.1	69	6.2 U	129 U	1117
SW1-4-10	63 U	4560	5416	379.1	1193	7.8	157	6.9 U	124 U	2581
SW1-4-15	54 U	2800	3799	237.1	672	4.8	79	8.5	118 U	2139
SW1-4-20	38 U	1053	2339	142.9	265	3.6	46 U	5.0 U	181	628

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLc	8000	2500		1000		3500	2000	100	500	5,000
SW1-4-5	46 U	697	2985	159.4	1762	2.1	53 U	5.9 U	129 U	720
SW1-5-10	50 U	2075	3634	339.7	1158	4.7	92	6.2 U	125 U	1633
SW1-5-15	56 U	3299	4477	292.9	1006	6.1	97	8.6	112 U	2309
SW1-5-20	41 U	1011	2127	149.3	1191	3.4	52 U	5.7 U	150 U	655
SW1-5-5	43 U	977	2541	186.6	1278	3.5	53 U	8.2	134 U	805
SW1-6-10	50 U	1448	3312	237.1	2165	3.9	57 U	6.2 U	126 U	1309
SW1-6-15	47 U	1911	3266	213.4	798	5.0	53 U	10.2	122 U	1369
SW1-6-20	57 U	2924	5521	248.1	829	6.2	106	6.0 U	122 U	2307
SW1-6-5	52 U	1281	3505	180.0	2016	4.8	59 U	6.4 U	128 U	1215
SW1-7-10	60 U	3103	5168	370.0	1321	8.4	122	6.7 U	114 U	2292
SW1-7-15	40 U	859	2339	192.0	605	3.0	51 U	9.0	125 U	676
SW1-7-20	39 U	777	1687	125.1	864	1.1	52 U	5.7 U	141 U	569
SW1-7-5	51 U	1205	3585	183.7	2178	5.3	57 U	6.2 U	126 U	1143
SW2-1-10	61 U	2285	5098	191.0	1360	7.9	149	6.6 U	107 U	2073
SW2-1-15	71 U	3883	5994	361.1	1097	8.2	107	9.4	111 U	2734
SW2-1-20	101 U	85	14130	21.2	310	1.7 U	74 U	8.1 U	114 U	57
SW2-1-5	52 U	2827	3679	276.5	1027	4.4	126	6.1 U	119 U	2134
SW2-2-10	74 U	3083	8429	267.5	940	6.3	103	7.1 U	114 U	2007
SW2-2-15	65 U	2778	5975	264.6	1240	5.9	129	6.9 U	129	2186
SW2-2-20	103 U	82	15273	16.9	345	1.7 U	74 U	8.1 U	172	39 U
SW2-2-5	52 U	2903	3551	267.3	1006	4.0	101	6.2 U	115 U	2211
SW2-3-10	63 U	2716	5292	248.9	1924	5.2	116	6.9 U	119 U	2071
SW2-3-15	53 U	1412	3209	151.6	2219	4.0	62 U	6.7 U	141 U	1824
SW2-3-20	68 U	5064	6750	127.8	1915	7.6	187	6.7 U	111 U	2559
SW2-3-5	52 U	1211	3604	203.3	1521	2.3	58 U	6.2 U	121 U	1246
SW2-4-10	47 U	1253	2941	219.7	1129	4.1	82	6.2 U	129 U	1036
SW2-4-15	60 U	1621	5731	199.6	1560	4.4	83	12.7	113 U	2476
SW2-4-20	46 U	1758	3147	205.6	666	4.1	54 U	11.0	117 U	1082
SW2-4-5	50 U	1503	3236	221.2	1433	4.6	87	6.3 U	132 U	1191
SW2-5-10	48 U	1444	2937	194.8	952	3.8	57 U	9.0	129 U	1111
SW2-5-15	83 U	3566	10960	280.1	1127	7.2	148	8.5	121 U	2603
SW2-5-20	41 U	770	2700	167.1	402	2.6	49 U	5.4 U	117 U	605
SW2-5-5	47 U	1326	2866	204.6	749	2.9	66	9.0	124 U	1035
SW2-6-10	56 U	1990	4377	187.6	828	5.3	108	6.4 U	113 U	1713
SW2-6-15	65 U	1605	5541	165.2	1745	3.6	76	7.0 U	114 U	1724
SW2-6-20	65 U	3050	5553	163.4	2300	5.7	181	7.0 U	118 U	4752
SW2-6-5	49 U	1162	3311	167.2	1159	5.5	56 U	6.1 U	115 U	1070
SW2-7-10	44 U	1452	2895	221.0	740	3.4	53 U	8.8	120 U	1097
SW2-7-15	56 U	1499	4686	150.2	751	6.5	117	6.3 U	112 U	1100
SW2-7-20	51 U	2473	3501	141.9	617	3.9	96	6.5 U	114 U	2298
SW2-7-5	48 U	1429	3315	228.4	804	3.2	53 U	8.3	123 U	1068
SW3-1-10	68 U	507	4723	130.6	9415	4.2	75 U	8.0 U	341	1160
SW3-1-15	70 U	350	5829	78.5	6105	3.5 U	71 U	7.7 U	324	962
SW3-1-20	75 U	428	5344	111.8	5192	5.5	82 U	8.9 U	224 U	820
SW3-1-5	57 U	1851	3626	139.2	6566	5.4	67 U	8.0	129 U	2111

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLc	8000	2500		1000		3500	2000	100	500	5,000
SW3-2-10	68 U	2393	5311	310.8	2658	7.0	91	14.0	135 U	2063
SW3-2-15	70 U	2759	5494	364.4	1141	7.4	74 U	11.4	146 U	1903
SW3-2-20	55 U	1806	4263	152.6	1079	4.6	60 U	6.6	116 U	1405
SW3-2-5	71 U	2665	5645	337.8	2097	7.4	84	11.0	131 U	3404
SW3-3-10	58 U	910	3731	116.4	9501	5.2	69 U	7.4 U	139 U	1502
SW3-3-15	57 U	858	2954	148.4	7346	4.0	72 U	7.9 U	251	1278
SW3-3-20	64 U	972	4032	162.2	4414	3.7	77 U	9.8	206	1396
SW3-3-5	55 U	940	3015	115.5	5416	5.0	70 U	7.6 U	161 U	1362
SW3-4-10	62 U	399	3753	72.9	2877	2.3	72 U	7.8 U	167 U	555
SW3-4-15	62 U	453	3749	89.8	4093	2.6	72 U	8.0 U	192	827
SW3-4-20	65 U	1594	4766	229.2	3574	4.8	71 U	8.2	132 U	1503
SW3-4-5	63 U	947	3949	171.0	3642	4.2	74 U	8.1 U	247	1129
SW3-5-10	52 U	647	2250	90.0	3613	2.6	71 U	7.6 U	172 U	800
SW3-5-15	55 U	323	2745	38.9	4078	2.1	71 U	7.8 U	184 U	502
SW3-5-20	65 U	905	4137	222.2	3112	3.1	76 U	8.3 U	168 U	1261
SW3-5-5	53 U	829	3011	116.5	4253	2.7	67 U	7.3 U	230	1276
SW3-6-10	49 U	767	2362	112.6	3010	3.0	64 U	6.9 U	156 U	1023
SW3-6-15	61 U	853	3914	143.3	2233	7.3	69 U	9.6	162 U	1042
SW3-6-20	70 U	610	4790	145.4	5995	5.2	80 U	8.7 U	186 U	1582
SW3-6-5	52 U	730	2585	94.2	3817	3.8	66 U	7.2 U	167 U	1138
SW3-7-10	60 U	1115	3929	227.3	3333	5.4	68 U	7.6 U	145 U	1193
SW3-7-15	63 U	1006	4308	170.9	3947	6.7	72 U	7.9 U	155 U	1136
SW3-7-20	68 U	817	4282	115.2	4360	2.7 U	81 U	8.7 U	205 U	1131
SW3-7-5	51 U	376	2622	45.8	4856	3.4	69 U	7.5 U	176 U	750
SW4-1-10	53 U	2485	3904	154.7	1556	4.7	147	6.3 U	112 U	2097
SW4-1-15	48 U	1231	3000	187.3	1806	5.7	62	6.4 U	122 U	1477
SW4-1-20	60 U	4302	4650	173.7	1342	10.5	134	6.5 U	117 U	2620
SW4-1-5	55 U	5251	3890	176.8	1098	7.7	193	6.5 U	126	3046
SW4-2-10	55 U	2257	4473	147.1	2155	3.8	59 U	6.4 U	114 U	1946
SW4-2-15	51 U	1078	3448	154.2	2462	2.6	59 U	6.4 U	116 U	1546
SW4-2-20	53 U	1285	3826	201.7	2523	2.9	59 U	6.4 U	133 U	1503
SW4-2-5	74 U	7941	6841	385.9	1041	33.5	489	7.4 U	124 U	4640
SW4-3-10	54 U	687	3434	72.7	9571	3.3	64 U	7.0 U	176	865
SW4-3-15	50 U	748	3205	61.1	5619	3.1	61 U	6.6 U	142 U	667
SW4-3-20	51 U	1006	3022	154.6	2338	4.2	61 U	6.6 U	126 U	1568
SW4-3-5	54 U	790	3002	47.8	3278	3.5	68 U	7.4 U	174 U	732
SW4-4-10	55 U	1320	3251	104.1	3396	3.1	67 U	7.3 U	163 U	1096
SW4-4-15	57 U	246	3655	32.5	5297	4.6	68 U	7.1 U	156 U	675
SW4-4-20	49 U	1318	3478	137.4	1960	2.1 U	56 U	6.1 U	119 U	1495
SW4-4-5	49 U	1340	3002	98.3	3706	4.4	60 U	6.4 U	277	1612
SW4-5-10	47 U	914	2673	115.0	1972	2.8	60 U	6.6 U	129 U	838
SW4-5-15	49 U	1212	3454	146.3	1755	3.2	65	6.1 U	114 U	1304
SW4-5-20	59 U	1499	4046	186.6	1472	4.6	97	7.9	151 U	2040
SW4-5-5	43 U	919	2260	88.9	2847	3.3	56 U	6.1 U	138 U	698
SW5-1-10	90 U	3421	11401	531.5	6037	6.7	100	7.7 U	129 U	1913

XRF ID	Co Q	Cu Q	Fe Q	Pb Q	Mn Q	Mo Q	Ni Q	Se Q	Ag Q	Zn Q
PRGr	900	3100		150	1800		1600	390	390	23,000
TTLC	8000	2500		1000		3500	2000	100	500	5,000
SW5-1-15	57 U	1352	3958	155.8	899	8.7	64 U	7.0 U	145 U	1019
SW5-1-20	45 U	450	2453	129.4	2893	1.6 U	57 U	6.3 U	159	764
SW5-1-5	119 U	9660	18375	380.8	4461	22.8	303	8.9 U	151	6654
SW5-2-10	49 U	282	3218	22.1	6888	2.7 U	58 U	6.2 U	129 U	773
SW5-2-15	48 U	1246	3321	114.8	1713	3.7	55 U	5.9 U	110 U	1272
SW5-2-20	49 U	471	2972	102.6	1811	2.9 U	60 U	6.6 U	130 U	775
SW5-2-5	37 U	574	1855	52.8	4498	1.2 U	48 U	5.4 U	119 U	872
SW5-3-10	38 U	986	1846	151.0	744	5.0	50 U	5.4 U	128 U	879
SW5-3-15	42 U	1114	2715	237.6	912	7.9	76	5.5 U	157	1264
SW5-3-20	67 U	2245	5488	351.7	1360	7.1	114	7.4 U	139 U	2244
SW5-3-5	44 U	829	2216	75.3	2558	2.2	56 U	6.1 U	204	896
SW5-4-10	51 U	1123	3118	169.4	3726	3.1	62 U	6.8 U	154	1490
SW5-4-15	61 U	1255	4496	150.6	1730	3.9	81	7.1 U	139 U	1757
SW5-4-20	43 U	1440	2806	151.9	1043	2.0	50 U	5.5 U	115 U	1806
SW5-4-5	46 U	680	2260	92.3	3053	1.6 U	61 U	6.6 U	205	886
SW5-5-10	57 U	1316	4464	522.3	871	2.2	99	6.8 U	143 U	1725
SW5-5-15	68 U	3741	4461	433.0	1539	37.9	138	26.1	212	1573
SW5-5-20	67 U	516	4175	171.6	2222	2.6 U	79 U	8.5 U	179 U	1355
SW5-5-5	58 U	694	2978	85.5	4195	2.2	72 U	7.8 U	196 U	970
SW5-6-10	52 U	1314	3645	171.9	1446	2.5 U	59 U	6.5 U	132 U	1292
SW5-6-15	68 U	1199	5471	187.9	2338	6.6	91	8.0 U	149 U	1149
SW5-6-20	63 U	2118	4372	200.7	2941	13.3	74 U	22.9	185	2737
SW5-6-5	62 U	820	2834	90.8	3337	2.2	81 U	8.7 U	241 U	1014
SW5-7-10	66 U	2362	5878	423.5	1026	6.5	69	16.8	342	1497
SW5-7-15	64 U	1485	4865	236.1	1487	4.1	70	8.5	142 U	1552
SW5-7-20	59 U	1293	4059	211.4	2245	4.5	68 U	7.4 U	138 U	2252
SW5-7-5	40 U	990	2564	168.3	678	2.8	46 U	5.0 U	117 U	700

Appendix H-2

Waste Data




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206-521-7600 Fax 206-521-7601
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MEMORANDUM

DATE: 25 October 2006

TO: Ben Castellana, Ph.D., Weston Solutions, Sherman Oaks

FROM: Paul Swift, Ph.D., Weston Solutions, Seattle 

SUBJECT: Review and Validation – Metals in Soils and Sediments Data
Laboratory Group: 06181c
Site: Halaco Engineering Company, Oxnard, California
Project: Integrated Assessment

CONTRACT: GSA W91238-05-F-0052

WORK ORDER: 12767.062.317.5000

cc: Weston Solutions project file

The quality assurance review and validation of analytical results from metals in soil/sediment samples, laboratory group **06181c**, collected from the Halaco Engineering Company site, 6200 Perkins Road, Oxnard, Ventura County, California between 21 June and 24 June, 2006 has been completed.

The samples were analyzed for CLP Target Analyte List (TAL) metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc), boron, mercury, and molybdenum by the U.S. EPA Region 9 Laboratory, of Richmond, California.

Samples were prepared for analysis of all metals except mercury following EPA SW-846 Method 3050B, acid digestion of sediments, sludges, and soils, and analyzed following EPA Method 6010B, inductively-coupled plasma – atomic emission spectrometry (ICP- AES). Samples submitted for mercury analysis were prepared and analyzed following EPA SW-846 Method 7473/laboratory SOP 535, thermal decomposition, amalgamation, and atomic absorption spectrophotometry (TDA-AAS).

The following samples are included in this quality assurance review.

MY2JJ4	MY2JK7	MY2JM9	MY2JL0
MY2JM6	MY2JN7	MY2JNA	

Data Review, Verification, Validation, and Qualification

The following comments refer to the laboratory performance in meeting the quality control criteria described in the individual analytical methods. The review follows the format described in the *National Functional Guidelines for Inorganic Data Review* (USEPA 2004) and specific procedural details provided in the individual analytical methods and the analytical laboratory's standard operating procedures.

Only sample result and quality control (QC) summary sheets were provided by the laboratory for review and validation. No QC exceedances were noted by the laboratory, other than those described below.

Data validation was performed to assess overall data quality and usability relative to project data quality objectives (DQOs) specified in the project Quality Assurance Project Plan (QAPP).

METALS ANALYSIS (SW846 6010B/7473)

1. **Timeliness** – *acceptable*

All samples met holding time criteria of 180 days for metals and 28 days for mercury for the initial sample analysis.

2. **Initial Calibration** – *not applicable*

Initial calibration data were not provided by the laboratory; however, the laboratory did not note any exceptions.

3. **Continuing Calibration Check Sample Analysis** – *not applicable*

Continuing calibration check sample analysis results were not provided by the laboratory; however, the laboratory did not note any exceptions.

4. **Detection Limits** – *acceptable*

Laboratory method detection limits (MDL) and reporting limits met project-required reporting limits.

5. **Blank Sample Analysis** – *acceptable*

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

b) Laboratory Instrument Blanks

Laboratory instrument blank recoveries were not provided by the laboratory; however, the laboratory did not note any exceptions.

c) **Field / Equipment Blanks**

No field blanks were associated with this analytical group.

6. Laboratory Control Sample / Standard Reference Material Analysis (LCS / SRM) – acceptable

Recovery of the analytes from the LCS/SRM samples met the acceptance criteria in use at the laboratory.

7. Matrix Spike and Matrix Spike Duplicate Sample Analysis (MS/MSD)

Analyte recoveries from the MS/MSD samples met laboratory precision and accuracy criteria, with the following exceptions.

- Recoveries of antimony (60%) and nickel (62%) were less than the lower control limit in matrix spike sample **MY2JK7**.
- Recoveries of antimony (61%) and lead (67%) were less than the lower control limit in duplicate spike sample **MY2JK7**.

Results for nickel and lead were qualified as estimated concentrations (J), possible low bias, in the parent sample **MY2JK7** only.

Recovery of antimony from solid matrices is problematic, and additional preparative steps must be employed to achieve acceptable recoveries. Antimony was not detected in any field sample; and results for antimony in all samples were qualified as not detected at an estimated quantitation limit (UJ), unknown bias.

Analyte recoveries from the MS/MSD samples were sufficient to meet project DQOs.

8. Laboratory Duplicate Sample Analysis – not applicable

Duplicate sample analysis was not performed for this sample delivery group.

9. Field Duplicate Sample Analysis – not applicable

Field duplicate samples were not submitted for analysis.

10. Serial Dilution Analysis – not applicable

Serial dilution percent difference determinations were not provided by the laboratory; however, the laboratory did not note any exceptions.

11. Interference Check Sample Analysis – *not applicable*

Interference check sample analysis results were not provided by the laboratory; however, the laboratory did not note any exceptions.

12. Sample Analysis – *acceptable*

All laboratory deliverables were present. No discrepancies were noted.

Laboratory Contact

No other laboratory contact was required for corrective action purposes.

Data Assessment and Reconciliation with Project Data Quality Objectives

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the collection of samples for the project.

Upon consideration of the comments and data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

Any data qualifiers applied by the laboratory have been removed from the data summary sheets and superceded by data validation qualifiers as follow:

The following qualifiers are used to modify the data quality and usefulness of individual analytical results.

- U - The compound was analyzed for, but was not detected.
- UJ - The compound was analyzed for, but was not detected. The reported concentration is an estimate of the quantitation limit due to QC exceedance(s).
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the laboratory reporting limit or lowest calibration standard.




Weston Solutions, Inc.
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190 Queen Anne Avenue North
Seattle, Washington 98109-4926
206-521-7600 Fax 206-521-7601
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MEMORANDUM

DATE: 25 October 2006

TO: Ben Castellana, Ph.D., Weston Solutions, Sherman Oaks

FROM: Paul Swift, Ph.D., Weston Solutions, Seattle 

SUBJECT: Review and Validation – Metals in Soils and Sediments Data
Laboratory Group: 06181e
Site: Halaco Engineering Company, Oxnard, California
Project: Integrated Assessment

CONTRACT: GSA W91238-05-F-0052

WORK ORDER: 12767.062.317.5000

cc: Weston Solutions project file

The quality assurance review and validation of analytical results from metals in soil/sediment samples, laboratory group **06181e**, collected from the Halaco Engineering Company site, 6200 Perkins Road, Oxnard, Ventura County, California between 21 June and 24 June, 2006 has been completed.

The samples were analyzed for CLP Target Analyte List (TAL) metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc), boron, mercury, and molybdenum by the U.S. EPA Region 9 Laboratory, of Richmond, California.

Samples were prepared for analysis of all metals except mercury following EPA SW-846 Method 3050B, acid digestion of sediments, sludges, and soils, and analyzed following EPA Method 6010B, inductively-coupled plasma – atomic emission spectrometry (ICP- AES). Samples submitted for mercury analysis were prepared and analyzed following EPA SW-846 Method 7473/laboratory SOP 535, thermal decomposition, amalgamation, and atomic absorption spectrophotometry (TDA-AAS).

The following samples are included in this quality assurance review.

MY2JT3

MY2JT5

MY2JT8

Data Review, Verification, Validation, and Qualification

The following comments refer to the laboratory performance in meeting the quality control criteria described in the individual analytical methods. The review follows the format described in the *National Functional Guidelines for Inorganic Data Review* (USEPA 2004) and specific procedural details provided in the individual analytical methods and the analytical laboratory's standard operating procedures.

Only sample result and quality control (QC) summary sheets were provided by the laboratory for review and validation. No QC exceedances were noted by the laboratory, other than those described below.

Data validation was performed to assess overall data quality and usability relative to project data quality objectives (DQOs) specified in the project Quality Assurance Project Plan (QAPP).

METALS ANALYSIS (SW846 6010B/7473)

1. Timeliness – acceptable

All samples met holding time criteria of 180 days for metals and 28 days for mercury for the initial sample analysis.

2. Initial Calibration – not applicable

Initial calibration data were not provided by the laboratory; however, the laboratory did not note any exceptions.

3. Continuing Calibration Check Sample Analysis – not applicable

Continuing calibration check sample analysis results were not provided by the laboratory; however, the laboratory did not note any exceptions.

4. Detection Limits – acceptable

Laboratory method detection limits (MDL) and reporting limits met project-required reporting limits.

5. Blank Sample Analysis – acceptable

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

b) Laboratory Instrument Blanks

Laboratory instrument blank recoveries were not provided by the laboratory; however, the laboratory did not note any exceptions.

c) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. **Laboratory Control Sample / Standard Reference Material Analysis (LCS / SRM) – acceptable**

Recovery of the analytes from the LCS/SRM samples met the acceptance criteria in use at the laboratory, with the following exceptions.

- Recoveries of silver (143% / 185%) exceeded the upper control limit for this analyte for duplicate SRM sample analyses. Recoveries of silver were within control limits for both the matrix and duplicate spike samples and the method blank samples. No data were qualified for this event.

7. **Matrix Spike and Matrix Spike Duplicate Sample Analysis (MS/MSD) – acceptable**

Analyte recoveries from the MS/MSD samples met laboratory precision and accuracy criteria, with the following exceptions.

- Recoveries of chromium (72%) and cobalt (66%) were less than the lower control limit in matrix spike sample **MY2JT2**.
- Recoveries of cobalt (66%) and sodium (70%) were less than the lower control limit in duplicate spike sample **MY2JT2**.

Results for the parent sample **MY2JK7** were not evaluated as part of this review. Since cobalt recoveries from the duplicate SRM analyses, no data were qualified for this event.

Recovery of chromium from the MS sample was slightly less than the lower control limit and may be attributable to sample homogeneity. Although recovery of sodium was less than the lower control limit from the MSD sample, this analyte is not used in Hazard Ranking System scoring and no data were qualified for this event.

Analyte recoveries from the MS/MSD samples were sufficient to meet project DQOs.

8. **Laboratory Duplicate Sample Analysis – not applicable**

Duplicate sample analysis was not performed for this sample delivery group.

9. Field Duplicate Sample Analysis – *not applicable*

Field duplicate samples were not submitted for analysis.

10. Serial Dilution Analysis – *not applicable*

Serial dilution percent difference determinations were not provided by the laboratory; however, the laboratory did not note any exceptions.

11. Interference Check Sample Analysis – *not applicable*

Interference check sample analysis results were not provided by the laboratory; however, the laboratory did not note any exceptions.

12. Sample Analysis – *acceptable*

All laboratory deliverables were present. No discrepancies were noted.

Laboratory Contact

No other laboratory contact was required for corrective action purposes.

Data Assessment and Reconciliation with Project Data Quality Objectives

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the collection of samples for the project.

Upon consideration of the comments and data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

Any data qualifiers applied by the laboratory have been removed from the data summary sheets and superceded by data validation qualifiers as follow:

The following qualifiers are used to modify the data quality and usefulness of individual analytical results.

- U - The compound was analyzed for, but was not detected.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the laboratory reporting limit or lowest calibration standard.



**United States Environmental Protection Agency
Region 9 Laboratory**

**1337 S. 46th Street Building 201
Richmond, CA 94804**

**Subject: Analytical Testing Results - Project R06S73
SDG: 06181C**

**From: Brenda Bettencourt, Director
EPA Region 9 Laboratory
MTS-2**

**To: Matthew Mitguard
States, Tribes and Site Assessment Office
SFD-9-1**

Attached are the results from the analysis of samples from the **Halaco Integrated Assessment** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Analyses included in this

Mercury
Solids, Dry Weight

Metals, ICP



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
MY2JJ4	0606057-01	Solid	06/21/06 10:35	06/30/06 07:35
MY2JK6	0606057-02	Solid	06/21/06 10:29	06/30/06 07:35
MY2JK7	0606057-03	Solid	06/21/06 11:25	06/30/06 07:35
MY2JM9	0606057-04	Solid	06/25/06 10:24	06/30/06 07:35
MY2JN0	0606057-05	Solid	06/25/06 09:41	06/30/06 07:35
MY2JN1	0606057-06	Solid	06/25/06 09:20	06/30/06 07:35
MY2JK8	0606057-07	Solid	06/21/06 13:40	06/30/06 07:35
MY2JK9	0606057-08	Solid	06/21/06 14:50	06/30/06 07:35
MY2JL0	0606057-09	Solid	06/21/06 15:55	06/30/06 07:35
MY2JM6	0606057-10	Solid	06/24/06 17:20	06/30/06 07:35
MY2JM7	0606057-11	Solid	06/25/06 12:12	06/30/06 07:35
MY2JM8	0606057-12	Solid	06/25/06 10:28	06/30/06 07:35
MY2JN2	0606057-13	Solid	06/25/06 08:25	06/30/06 07:35
MY2JN3	0606057-14	Solid	06/23/06 17:03	06/30/06 07:35
MY2JN4	0606057-15	Solid	06/23/06 16:15	06/30/06 07:35
MY2JN5	0606057-16	Solid	06/24/06 12:03	06/30/06 07:35
MY2JN6	0606057-17	Solid	06/24/06 08:38	06/30/06 07:35
MY2JN7	0606057-18	Solid	06/24/06 09:26	06/30/06 07:35
MY2JN8	0606057-19	Solid	06/24/06 10:30	06/30/06 07:35
MY2JN9	0606057-20	Solid	06/24/06 10:44	06/30/06 07:35

The samples were hand-delivered to the laboratory at 20 degrees Celsius.



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75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-01						Solid - Sampled: 06/21/06 10:35		
Sample ID: MY2JJ4						Metals by EPA 6000/7000 Series Methods		
Mercury	0.038		0.027	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	120000		220	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	22	"	"	"	07/10/06	6010B/SOP503
Arsenic	8.1		2.2	"	"	"	"	6010B/SOP503
Barium	5000		11	"	"	"	07/10/06	6010B/SOP503
Beryllium	93		0.22	"	"	"	07/10/06	6010B/SOP503
Boron	150		22	"	"	"	07/10/06	6010B/SOP503
Cadmium	4.4		1.1	"	"	"	"	6010B/SOP503
Calcium	4100		220	"	"	"	"	6010B/SOP503
Chromium	420		2.2	"	"	"	"	6010B/SOP503
Cobalt	2.9	C1, J	4.4	"	"	"	"	6010B/SOP503
Copper	1800		8.8	"	"	"	"	6010B/SOP503
Iron	10000		220	"	"	"	"	6010B/SOP503
Lead	210		3.3	"	"	"	07/10/06	6010B/SOP503
Magnesium	86000		110	"	"	"	07/10/06	6010B/SOP503
Manganese	3700		11	"	"	"	"	6010B/SOP503
Molybdenum	14		11	"	"	"	"	6010B/SOP503
Nickel	180		11	"	"	"	"	6010B/SOP503
Potassium	3700		1100	"	"	"	"	6010B/SOP503
Selenium	1.6	C1, J	2.2	"	"	"	07/10/06	6010B/SOP503
Silver	7.9		2.2	"	"	"	"	6010B/SOP503
Sodium	1800		110	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	11	"	"	"	07/10/06	6010B/SOP503
Vanadium	56		4.4	"	"	"	07/10/06	6010B/SOP503
Zinc	1700		8.8	"	"	"	"	6010B/SOP503
% Solids	91		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-02						Solid - Sampled: 06/21/06 10:29		
Sample ID: MY2JK6						Metals by EPA 6000/7000 Series Methods		
Mercury	0.043		0.036	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	120000		290	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	29	"	"	"	07/10/06	6010B/SOP503
Arsenic	19		2.9	"	"	"	"	6010B/SOP503
Barium	3700		14	"	"	"	07/10/06	6010B/SOP503
Beryllium	21		0.29	"	"	"	07/10/06	6010B/SOP503
Boron	250		29	"	"	"	07/10/06	6010B/SOP503
Cadmium	4.7		1.4	"	"	"	"	6010B/SOP503
Calcium	5700		290	"	"	"	"	6010B/SOP503
Chromium	350		2.9	"	"	"	"	6010B/SOP503
Cobalt	3.7	C1, J	5.8	"	"	"	"	6010B/SOP503
Copper	2000		12	"	"	"	"	6010B/SOP503
Iron	8200		290	"	"	"	"	6010B/SOP503
Lead	200		4.3	"	"	"	07/10/06	6010B/SOP503
Magnesium	110000		140	"	"	"	07/10/06	6010B/SOP503



United States Environmental Protection Agency Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 0606057-02

Solid - Sampled: 06/21/06 10:29

Sample ID: MY2JK6

Metals by EPA 6000/7000 Series Methods

Manganese	4000		14	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Molybdenum	10	C1, J	14	"	"	"	"	6010B/SOP503
Nickel	140		14	"	"	"	"	6010B/SOP503
Potassium	14000		1400	"	"	"	"	6010B/SOP503
Selenium	2.1	C1, J	2.9	"	"	"	07/10/06	6010B/SOP503
Silver	14		2.9	"	"	"	"	6010B/SOP503
Sodium	9100		140	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	14	"	"	"	07/10/06	6010B/SOP503
Vanadium	55		5.8	"	"	"	07/10/06	6010B/SOP503
Zinc	3000		46	"	"	"	07/12/06	6010B/SOP503
% Solids	69		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-03

Solid - Sampled: 06/21/06 11:25

Sample ID: MY2JK7

Metals by EPA 6000/7000 Series Methods

Mercury	0.067		0.028	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	120000		220	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	Q4, J, U	22	"	"	"	07/10/06	6010B/SOP503
Arsenic	5.4		2.2	"	"	"	"	6010B/SOP503
Barium	3200		11	"	"	"	07/10/06	6010B/SOP503
Beryllium	65		0.22	"	"	"	"	6010B/SOP503
Boron	62		22	"	"	"	"	6010B/SOP503
Cadmium	5.8		1.1	"	"	"	"	6010B/SOP503
Calcium	10000		220	"	"	"	"	6010B/SOP503
Chromium	350	Q6, J	2.2	"	"	"	"	6010B/SOP503
Cobalt	4.0	C1, J	4.5	"	"	"	"	6010B/SOP503
Copper	2800		9.0	"	"	"	"	6010B/SOP503
Iron	20000	Q6, J	220	"	"	"	"	6010B/SOP503
Lead	170	Q4, J	3.4	"	"	"	07/10/06	6010B/SOP503
Magnesium	100000		110	"	"	"	07/10/06	6010B/SOP503
Manganese	3900		11	"	"	"	"	6010B/SOP503
Molybdenum	16		11	"	"	"	"	6010B/SOP503
Nickel	200	Q4, J	11	"	"	"	"	6010B/SOP503
Potassium	1600		1100	"	"	"	"	6010B/SOP503
Selenium	ND	U	2.2	"	"	"	07/10/06	6010B/SOP503
Silver	8.9		2.2	"	"	"	"	6010B/SOP503
Sodium	730		110	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	11	"	"	"	07/10/06	6010B/SOP503
Vanadium	32		4.5	"	"	"	07/10/06	6010B/SOP503
Zinc	2500		36	"	"	"	07/12/06	6010B/SOP503
% Solids	89		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-04

Solid - Sampled: 06/25/06 10:24

Sample ID: MY2JM9

Metals by EPA 6000/7000 Series Methods

Mercury	0.10		0.041	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
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United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-04						Solid - Sampled: 06/25/06 10:24		
Sample ID: MY2JM9						Metals by EPA 6000/7000 Series Methods		
Aluminum	63000		330	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	33	"	"	"	07/10/06	6010B/SOP503
Arsenic	8.2		3.3	"	"	"	"	6010B/SOP503
Barium	13000		16	"	"	"	07/10/06	6010B/SOP503
Beryllium	48		0.33	"	"	"	07/10/06	6010B/SOP503
Boron	120		33	"	"	"	"	6010B/SOP503
Cadmium	9.6		1.6	"	"	"	"	6010B/SOP503
Calcium	2000		330	"	"	"	"	6010B/SOP503
Chromium	110		3.3	"	"	"	"	6010B/SOP503
Cobalt	ND	U	6.6	"	"	"	"	6010B/SOP503
Copper	880		13	"	"	"	"	6010B/SOP503
Iron	6900		330	"	"	"	"	6010B/SOP503
Lead	210		4.9	"	"	"	07/10/06	6010B/SOP503
Magnesium	180000		160	"	"	"	07/10/06	6010B/SOP503
Manganese	3900		16	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	16	"	"	"	07/10/06	6010B/SOP503
Nickel	53		16	"	"	"	"	6010B/SOP503
Potassium	4300		1600	"	"	"	"	6010B/SOP503
Selenium	ND	U	3.3	"	"	"	07/10/06	6010B/SOP503
Silver	8.2		3.3	"	"	"	"	6010B/SOP503
Sodium	3000		160	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	16	"	"	"	07/10/06	6010B/SOP503
Vanadium	23		6.6	"	"	"	07/10/06	6010B/SOP503
Zinc	1000		13	"	"	"	"	6010B/SOP503
% Solids	61		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-05

Solid - Sampled: 06/25/06 09:41

Sample ID: MY2JN0

Metals by EPA 6000/7000 Series Methods

Mercury	0.043		0.042	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	120000		340	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	34	"	"	"	07/10/06	6010B/SOP503
Arsenic	10		3.4	"	"	"	"	6010B/SOP503
Barium	12000		17	"	"	"	07/10/06	6010B/SOP503
Beryllium	41		0.34	"	"	"	07/10/06	6010B/SOP503
Boron	230		34	"	"	"	07/10/06	6010B/SOP503
Cadmium	5.5		1.7	"	"	"	07/10/06	6010B/SOP503
Calcium	4100		340	"	"	"	07/10/06	6010B/SOP503
Chromium	210		3.4	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U	6.8	"	"	"	"	6010B/SOP503
Copper	1300		14	"	"	"	07/10/06	6010B/SOP503
Iron	5800		340	"	"	"	"	6010B/SOP503
Lead	210		5.1	"	"	"	07/10/06	6010B/SOP503
Magnesium	120000		170	"	"	"	07/10/06	6010B/SOP503
Manganese	3300		17	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	17	"	"	"	07/10/06	6010B/SOP503



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75 Hawthorne Street
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SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-05 Solid - Sampled: 06/25/06 09:41								
Sample ID: MY2JN0 Metals by EPA 6000/7000 Series Methods								
Nickel	70		17	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Potassium	5400		1700	"	"	"	07/10/06	6010B/SOP503
Selenium	3.0	C1, J	3.4	"	"	"	07/10/06	6010B/SOP503
Silver	6.3		3.4	"	"	"	07/10/06	6010B/SOP503
Sodium	5600		170	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	17	"	"	"	07/10/06	6010B/SOP503
Vanadium	48		6.8	"	"	"	07/10/06	6010B/SOP503
Zinc	1200		14	"	"	"	"	6010B/SOP503
% Solids	59		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-06 Solid - Sampled: 06/25/06 09:20								
Sample ID: MY2JN1 Metals by EPA 6000/7000 Series Methods								
Mercury	0.061		0.040	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	130000		320	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	32	"	"	"	07/10/06	6010B/SOP503
Arsenic	9.0		3.2	"	"	"	"	6010B/SOP503
Barium	8300		16	"	"	"	07/10/06	6010B/SOP503
Beryllium	21		0.32	"	"	"	07/10/06	6010B/SOP503
Boron	210		32	"	"	"	07/10/06	6010B/SOP503
Cadmium	5.1		1.6	"	"	"	07/10/06	6010B/SOP503
Calcium	3000		320	"	"	"	07/10/06	6010B/SOP503
Chromium	310		3.2	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U	6.5	"	"	"	"	6010B/SOP503
Copper	1800		13	"	"	"	07/10/06	6010B/SOP503
Iron	5600		320	"	"	"	"	6010B/SOP503
Lead	210		4.8	"	"	"	07/10/06	6010B/SOP503
Magnesium	95000		160	"	"	"	07/10/06	6010B/SOP503
Manganese	2000		16	"	"	"	"	6010B/SOP503
Molybdenum	17		16	"	"	"	07/10/06	6010B/SOP503
Nickel	140		16	"	"	"	"	6010B/SOP503
Potassium	2700		1600	"	"	"	07/10/06	6010B/SOP503
Selenium	ND	U	3.2	"	"	"	07/10/06	6010B/SOP503
Silver	3.5		3.2	"	"	"	"	6010B/SOP503
Sodium	2200		160	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	16	"	"	"	07/10/06	6010B/SOP503
Vanadium	51		6.5	"	"	"	07/10/06	6010B/SOP503
Zinc	1600		13	"	"	"	"	6010B/SOP503
% Solids	62		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-07 Solid - Sampled: 06/21/06 13:40								
Sample ID: MY2JK8 Metals by EPA 6000/7000 Series Methods								
Mercury	0.037		0.028	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	110000		220	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	22	"	"	"	07/10/06	6010B/SOP503



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-07						Solid - Sampled: 06/21/06 13:40		
Sample ID: MY2JK8						Metals by EPA 6000/7000 Series Methods		
Arsenic	7.2		2.2	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Barium	4600		11	"	"	"	07/10/06	6010B/SOP503
Beryllium	51		0.22	"	"	"	07/10/06	6010B/SOP503
Boron	150		22	"	"	"	07/10/06	6010B/SOP503
Cadmium	4.3		1.1	"	"	"	"	6010B/SOP503
Calcium	3300		220	"	"	"	"	6010B/SOP503
Chromium	260		2.2	"	"	"	"	6010B/SOP503
Cobalt	ND	U	4.5	"	"	"	"	6010B/SOP503
Copper	1700		9.0	"	"	"	"	6010B/SOP503
Iron	10000		220	"	"	"	"	6010B/SOP503
Lead	190		3.4	"	"	"	07/10/06	6010B/SOP503
Magnesium	82000		110	"	"	"	07/10/06	6010B/SOP503
Manganese	3500		11	"	"	"	"	6010B/SOP503
Molybdenum	9.6	C1, J	11	"	"	"	"	6010B/SOP503
Nickel	120		11	"	"	"	"	6010B/SOP503
Potassium	3900		1100	"	"	"	"	6010B/SOP503
Selenium	1.5	C1, J	2.2	"	"	"	07/10/06	6010B/SOP503
Silver	9.2		2.2	"	"	"	"	6010B/SOP503
Sodium	1900		110	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	11	"	"	"	07/10/06	6010B/SOP503
Vanadium	51		4.5	"	"	"	07/10/06	6010B/SOP503
Zinc	1700		9.0	"	"	"	"	6010B/SOP503
% Solids	89		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-08
Sample ID: MY2JK9

Solid - Sampled: 06/21/06 14:50
Metals by EPA 6000/7000 Series Methods

Mercury	ND	U	0.028	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	27000		220	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	22	"	"	"	07/10/06	6010B/SOP503
Arsenic	2.3		2.2	"	"	"	"	6010B/SOP503
Barium	49000		110	"	"	"	07/12/06	6010B/SOP503
Beryllium	22		0.22	"	"	"	07/10/06	6010B/SOP503
Boron	12	C1, J	22	"	"	"	07/10/06	6010B/SOP503
Cadmium	0.56	C1, J	1.1	"	"	"	"	6010B/SOP503
Calcium	13000		220	"	"	"	"	6010B/SOP503
Chromium	40		2.2	"	"	"	"	6010B/SOP503
Cobalt	ND	U	4.5	"	"	"	"	6010B/SOP503
Copper	120		9.0	"	"	"	"	6010B/SOP503
Iron	5100		220	"	"	"	"	6010B/SOP503
Lead	10		3.4	"	"	"	07/10/06	6010B/SOP503
Magnesium	160000		110	"	"	"	07/10/06	6010B/SOP503
Manganese	8500		11	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	11	"	"	"	"	6010B/SOP503
Nickel	50		11	"	"	"	"	6010B/SOP503



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Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
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SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-08 Solid - Sampled: 06/21/06 14:50								
Sample ID: MY2JK9 Metals by EPA 6000/7000 Series Methods								
Potassium	990	C1, J	1100	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Selenium	ND	U	2.2	"	"	"	07/10/06	6010B/SOP503
Silver	5.6		2.2	"	"	"	"	6010B/SOP503
Sodium	250		110	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	11	"	"	"	07/10/06	6010B/SOP503
Vanadium	21		4.5	"	"	"	07/10/06	6010B/SOP503
Zinc	1100		9.0	"	"	"	"	6010B/SOP503
% Solids	89		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-09 Solid - Sampled: 06/21/06 15:55								
Sample ID: MY2JL0 Metals by EPA 6000/7000 Series Methods								
Mercury	0.016	C1, J	0.033	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	57000		260	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	26	"	"	"	07/10/06	6010B/SOP503
Arsenic	7.5		2.6	"	"	"	"	6010B/SOP503
Barium	3600		13	"	"	"	07/10/06	6010B/SOP503
Beryllium	27000		26	"	"	"	07/12/06	6010B/SOP503
Boron	58		26	"	"	"	07/10/06	6010B/SOP503
Cadmium	26		1.3	"	"	"	"	6010B/SOP503
Calcium	6500		260	"	"	"	"	6010B/SOP503
Chromium	1700		2.6	"	"	"	"	6010B/SOP503
Cobalt	8.2		5.3	"	"	"	"	6010B/SOP503
Copper	1700		11	"	"	"	"	6010B/SOP503
Iron	28000		260	"	"	"	"	6010B/SOP503
Lead	300		3.9	"	"	"	07/10/06	6010B/SOP503
Magnesium	140000		130	"	"	"	07/10/06	6010B/SOP503
Manganese	6800		13	"	"	"	"	6010B/SOP503
Molybdenum	30		13	"	"	"	"	6010B/SOP503
Nickel	610		13	"	"	"	"	6010B/SOP503
Potassium	950	C1, J	1300	"	"	"	"	6010B/SOP503
Selenium	ND	U	2.6	"	"	"	07/10/06	6010B/SOP503
Silver	62		2.6	"	"	"	"	6010B/SOP503
Sodium	330		130	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	13	"	"	"	07/10/06	6010B/SOP503
Vanadium	68		5.3	"	"	"	07/10/06	6010B/SOP503
Zinc	1500		11	"	"	"	"	6010B/SOP503
% Solids	76		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-10 Solid - Sampled: 06/24/06 17:20								
Sample ID: MY2JM6 Metals by EPA 6000/7000 Series Methods								
Mercury	0.083		0.038	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	120000		300	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	30	"	"	"	07/10/06	6010B/SOP503
Arsenic	6.3		3.0	"	"	"	"	6010B/SOP503



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SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-10						Solid - Sampled: 06/24/06 17:20		
Sample ID: MY2JM6						Metals by EPA 6000/7000 Series Methods		
Barium	9700		15	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Beryllium	23		0.30	"	"	"	07/10/06	6010B/SOP503
Boron	180		30	"	"	"	07/10/06	6010B/SOP503
Cadmium	5.7		1.5	"	"	"	"	6010B/SOP503
Calcium	4900		300	"	"	"	"	6010B/SOP503
Chromium	220		3.0	"	"	"	"	6010B/SOP503
Cobalt	ND	U	6.1	"	"	"	"	6010B/SOP503
Copper	1700		12	"	"	"	"	6010B/SOP503
Iron	7100		300	"	"	"	"	6010B/SOP503
Lead	280		4.5	"	"	"	07/10/06	6010B/SOP503
Magnesium	81000		150	"	"	"	07/10/06	6010B/SOP503
Manganese	2400		15	"	"	"	"	6010B/SOP503
Molybdenum	10	C1, J	15	"	"	"	"	6010B/SOP503
Nickel	96		15	"	"	"	"	6010B/SOP503
Potassium	3400		1500	"	"	"	"	6010B/SOP503
Selenium	1.5	C1, J	3.0	"	"	"	07/10/06	6010B/SOP503
Silver	4.8		3.0	"	"	"	"	6010B/SOP503
Sodium	2700		150	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	15	"	"	"	07/10/06	6010B/SOP503
Vanadium	49		6.1	"	"	"	07/10/06	6010B/SOP503
Zinc	1500		12	"	"	"	"	6010B/SOP503
% Solids	66		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-11						Solid - Sampled: 06/25/06 12:12		
Sample ID: MY2JM7						Metals by EPA 6000/7000 Series Methods		
Mercury	0.018	C1, J	0.028	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	190000		220	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	22	"	"	"	07/10/06	6010B/SOP503
Arsenic	4.4		2.2	"	"	"	"	6010B/SOP503
Barium	380		11	"	"	"	07/10/06	6010B/SOP503
Beryllium	4.0		0.22	"	"	"	07/10/06	6010B/SOP503
Boron	83		22	"	"	"	07/10/06	6010B/SOP503
Cadmium	3.7		1.1	"	"	"	"	6010B/SOP503
Calcium	5000		220	"	"	"	"	6010B/SOP503
Chromium	390		2.2	"	"	"	"	6010B/SOP503
Cobalt	6.5		4.5	"	"	"	"	6010B/SOP503
Copper	2500		9.0	"	"	"	"	6010B/SOP503
Iron	9600		220	"	"	"	"	6010B/SOP503
Lead	220		3.4	"	"	"	07/10/06	6010B/SOP503
Magnesium	23000		110	"	"	"	07/10/06	6010B/SOP503
Manganese	1500		11	"	"	"	"	6010B/SOP503
Molybdenum	12		11	"	"	"	"	6010B/SOP503
Nickel	150		11	"	"	"	"	6010B/SOP503
Potassium	7700		1100	"	"	"	"	6010B/SOP503



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Project: Halaco Integrated Assessment

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SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-11 Solid - Sampled: 06/25/06 12:12								
Sample ID: MY2JM7 Metals by EPA 6000/7000 Series Methods								
Selenium	ND	U	2.2	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Silver	2.4		2.2	"	"	"	"	6010B/SOP503
Sodium	8900		110	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	11	"	"	"	07/10/06	6010B/SOP503
Vanadium	55		4.5	"	"	"	07/10/06	6010B/SOP503
Zinc	2000		36	"	"	"	07/12/06	6010B/SOP503
% Solids	89		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-12 Solid - Sampled: 06/25/06 10:28								
Sample ID: MY2JM8 Metals by EPA 6000/7000 Series Methods								
Mercury	0.031	C1, J	0.033	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	190000		260	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	26	"	"	"	07/10/06	6010B/SOP503
Arsenic	7.5		2.6	"	"	"	"	6010B/SOP503
Barium	3100		13	"	"	"	07/10/06	6010B/SOP503
Beryllium	10		0.26	"	"	"	07/10/06	6010B/SOP503
Boron	190		26	"	"	"	"	6010B/SOP503
Cadmium	7.4		1.3	"	"	"	"	6010B/SOP503
Calcium	5300		260	"	"	"	07/10/06	6010B/SOP503
Chromium	370		2.6	"	"	"	07/10/06	6010B/SOP503
Cobalt	5.8		5.3	"	"	"	"	6010B/SOP503
Copper	4000		11	"	"	"	07/10/06	6010B/SOP503
Iron	9200		260	"	"	"	07/10/06	6010B/SOP503
Lead	390		3.9	"	"	"	07/10/06	6010B/SOP503
Magnesium	56000		130	"	"	"	07/10/06	6010B/SOP503
Manganese	2000		13	"	"	"	"	6010B/SOP503
Molybdenum	15		13	"	"	"	07/10/06	6010B/SOP503
Nickel	180		13	"	"	"	"	6010B/SOP503
Potassium	2300		1300	"	"	"	"	6010B/SOP503
Selenium	ND	U	2.6	"	"	"	07/10/06	6010B/SOP503
Silver	5.5		2.6	"	"	"	07/10/06	6010B/SOP503
Sodium	2100		130	"	"	"	"	6010B/SOP503
Thallium	ND	U	13	"	"	"	07/10/06	6010B/SOP503
Vanadium	64		5.3	"	"	"	07/10/06	6010B/SOP503
Zinc	2600		42	"	"	"	07/12/06	6010B/SOP503
% Solids	76		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-13 Solid - Sampled: 06/25/06 08:25								
Sample ID: MY2JN2 Metals by EPA 6000/7000 Series Methods								
Mercury	0.061		0.045	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	97000		360	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	36	"	"	"	07/10/06	6010B/SOP503
Arsenic	9.4		3.6	"	"	"	"	6010B/SOP503
Barium	10000		18	"	"	"	07/10/06	6010B/SOP503



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Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-13						Solid - Sampled: 06/25/06 08:25		
Sample ID: MY2JN2						Metals by EPA 6000/7000 Series Methods		
Beryllium	25		0.36	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Boron	210		36	"	"	"	07/10/06	6010B/SOP503
Cadmium	5.4		1.8	"	"	"	07/10/06	6010B/SOP503
Calcium	4800		360	"	"	"	07/10/06	6010B/SOP503
Chromium	240		3.6	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U	7.3	"	"	"	"	6010B/SOP503
Copper	1300		15	"	"	"	07/10/06	6010B/SOP503
Iron	5400		360	"	"	"	"	6010B/SOP503
Lead	240		5.5	"	"	"	07/10/06	6010B/SOP503
Magnesium	110000		180	"	"	"	07/10/06	6010B/SOP503
Manganese	2000		18	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	18	"	"	"	07/10/06	6010B/SOP503
Nickel	72		18	"	"	"	"	6010B/SOP503
Potassium	11000		1800	"	"	"	07/10/06	6010B/SOP503
Selenium	4.4		3.6	"	"	"	07/10/06	6010B/SOP503
Silver	3.5	C1, J	3.6	"	"	"	07/10/06	6010B/SOP503
Sodium	13000		180	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	18	"	"	"	07/10/06	6010B/SOP503
Vanadium	45		7.3	"	"	"	07/10/06	6010B/SOP503
Zinc	1100		15	"	"	"	"	6010B/SOP503
% Solids	55		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-14						Solid - Sampled: 06/23/06 17:03		
Sample ID: MY2JN3						Metals by EPA 6000/7000 Series Methods		
Mercury	ND	U	0.027	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	7800		220	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	22	"	"	"	07/11/06	6010B/SOP503
Arsenic	2.8		2.2	"	"	"	07/10/06	6010B/SOP503
Barium	130		11	"	"	"	07/10/06	6010B/SOP503
Beryllium	0.39		0.22	"	"	"	07/10/06	6010B/SOP503
Boron	14	C1, J	22	"	"	"	07/10/06	6010B/SOP503
Cadmium	0.58	C1, J	1.1	"	"	"	"	6010B/SOP503
Calcium	9400		220	"	"	"	"	6010B/SOP503
Chromium	16		2.2	"	"	"	"	6010B/SOP503
Cobalt	4.1	C1, J	4.3	"	"	"	"	6010B/SOP503
Copper	18		8.7	"	"	"	"	6010B/SOP503
Iron	14000		220	"	"	"	"	6010B/SOP503
Lead	5.3		3.3	"	"	"	07/10/06	6010B/SOP503
Magnesium	4100		110	"	"	"	07/10/06	6010B/SOP503
Manganese	220		11	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	11	"	"	"	"	6010B/SOP503
Nickel	13		11	"	"	"	"	6010B/SOP503
Potassium	7200		1100	"	"	"	"	6010B/SOP503
Selenium	ND	U	2.2	"	"	"	07/10/06	6010B/SOP503
Silver	ND	U	2.2	"	"	"	"	6010B/SOP503



United States Environmental Protection Agency Region 9 Laboratory

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Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-14						Solid - Sampled: 06/23/06 17:03		
Sample ID: MY2JN3						Metals by EPA 6000/7000 Series Methods		
Sodium	4700		110	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Thallium	ND	U	11	"	"	"	07/10/06	6010B/SOP503
Vanadium	26		4.3	"	"	"	07/10/06	6010B/SOP503
Zinc	42		8.7	"	"	"	"	6010B/SOP503
% Solids	92		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-15						Solid - Sampled: 06/23/06 16:15		
Sample ID: MY2JN4						Metals by EPA 6000/7000 Series Methods		
Mercury	0.026	C1, J	0.027	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	8400		220	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	22	"	"	"	07/11/06	6010B/SOP503
Arsenic	2.9		2.2	"	"	"	07/10/06	6010B/SOP503
Barium	140		11	"	"	"	07/10/06	6010B/SOP503
Beryllium	0.40		0.22	"	"	"	"	6010B/SOP503
Boron	12	C1, J	22	"	"	"	"	6010B/SOP503
Cadmium	0.72	C1, J	1.1	"	"	"	"	6010B/SOP503
Calcium	12000		220	"	"	"	07/10/06	6010B/SOP503
Chromium	15		2.2	"	"	"	07/10/06	6010B/SOP503
Cobalt	4.5		4.3	"	"	"	"	6010B/SOP503
Copper	15		8.7	"	"	"	"	6010B/SOP503
Iron	16000		220	"	"	"	07/10/06	6010B/SOP503
Lead	4.0		3.3	"	"	"	07/10/06	6010B/SOP503
Magnesium	4800		110	"	"	"	07/10/06	6010B/SOP503
Manganese	240		11	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	11	"	"	"	"	6010B/SOP503
Nickel	14		11	"	"	"	"	6010B/SOP503
Potassium	4100		1100	"	"	"	"	6010B/SOP503
Selenium	ND	U	2.2	"	"	"	07/10/06	6010B/SOP503
Silver	ND	U	2.2	"	"	"	07/10/06	6010B/SOP503
Sodium	2800		110	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	11	"	"	"	07/10/06	6010B/SOP503
Vanadium	29		4.3	"	"	"	07/10/06	6010B/SOP503
Zinc	40		8.7	"	"	"	"	6010B/SOP503
% Solids	92		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-16						Solid - Sampled: 06/24/06 12:03		
Sample ID: MY2JN5						Metals by EPA 6000/7000 Series Methods		
Mercury	0.050		0.035	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	120000		280	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	28	"	"	"	07/11/06	6010B/SOP503
Arsenic	14		2.8	"	"	"	07/10/06	6010B/SOP503
Barium	11000		14	"	"	"	07/10/06	6010B/SOP503
Beryllium	14		0.28	"	"	"	07/10/06	6010B/SOP503
Boron	150		28	"	"	"	07/10/06	6010B/SOP503



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SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-16						Solid - Sampled: 06/24/06 12:03		
Sample ID: MY2JN5						Metals by EPA 6000/7000 Series Methods		
Cadmium	3.8		1.4	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Calcium	3100		280	"	"	"	07/10/06	6010B/SOP503
Chromium	240		2.8	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U	5.6	"	"	"	"	6010B/SOP503
Copper	1600		11	"	"	"	07/10/06	6010B/SOP503
Iron	6400		280	"	"	"	"	6010B/SOP503
Lead	180		4.2	"	"	"	07/10/06	6010B/SOP503
Magnesium	110000		140	"	"	"	07/10/06	6010B/SOP503
Manganese	3200		14	"	"	"	"	6010B/SOP503
Molybdenum	9.1	C1, J	14	"	"	"	07/10/06	6010B/SOP503
Nickel	85		14	"	"	"	"	6010B/SOP503
Potassium	4400		1400	"	"	"	07/10/06	6010B/SOP503
Selenium	1.5	C1, J	2.8	"	"	"	07/10/06	6010B/SOP503
Silver	8.1		2.8	"	"	"	07/10/06	6010B/SOP503
Sodium	3200		140	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	14	"	"	"	07/10/06	6010B/SOP503
Vanadium	54		5.6	"	"	"	07/10/06	6010B/SOP503
Zinc	2000		11	"	"	"	"	6010B/SOP503
% Solids	72		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-17						Solid - Sampled: 06/24/06 08:38		
Sample ID: MY2JN6						Metals by EPA 6000/7000 Series Methods		
Mercury	0.064		0.037	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	110000		300	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	30	"	"	"	07/12/06	6010B/SOP503
Arsenic	15		3.0	"	"	"	07/10/06	6010B/SOP503
Barium	2500		15	"	"	"	07/10/06	6010B/SOP503
Beryllium	15		0.30	"	"	"	07/10/06	6010B/SOP503
Boron	270		30	"	"	"	07/10/06	6010B/SOP503
Cadmium	8.1		1.5	"	"	"	07/10/06	6010B/SOP503
Calcium	5400		300	"	"	"	07/10/06	6010B/SOP503
Chromium	420		3.0	"	"	"	07/10/06	6010B/SOP503
Cobalt	5.2	C1, J	6.0	"	"	"	"	6010B/SOP503
Copper	1900		12	"	"	"	07/10/06	6010B/SOP503
Iron	8400		300	"	"	"	"	6010B/SOP503
Lead	250		4.5	"	"	"	07/10/06	6010B/SOP503
Magnesium	73000		150	"	"	"	07/10/06	6010B/SOP503
Manganese	1800		15	"	"	"	"	6010B/SOP503
Molybdenum	32		15	"	"	"	07/10/06	6010B/SOP503
Nickel	170		15	"	"	"	"	6010B/SOP503
Potassium	11000		1500	"	"	"	07/10/06	6010B/SOP503
Selenium	7.3		3.0	"	"	"	07/10/06	6010B/SOP503
Silver	3.4		3.0	"	"	"	07/10/06	6010B/SOP503
Sodium	13000		150	"	"	"	07/10/06	6010B/SOP503



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SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-17						Solid - Sampled: 06/24/06 08:38		
Sample ID: MY2JN6						Metals by EPA 6000/7000 Series Methods		
Thallium	ND	U	15	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Vanadium	48		6.0	"	"	"	07/10/06	6010B/SOP503
Zinc	1600		12	"	"	"	"	6010B/SOP503
% Solids	67		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-18						Solid - Sampled: 06/24/06 09:26		
Sample ID: MY2JN7						Metals by EPA 6000/7000 Series Methods		
Mercury	0.040		0.034	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	170000		270	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	27	"	"	"	07/12/06	6010B/SOP503
Arsenic	10		2.7	"	"	"	07/10/06	6010B/SOP503
Barium	3200		14	"	"	"	07/10/06	6010B/SOP503
Beryllium	10		0.27	"	"	"	07/10/06	6010B/SOP503
Boron	200		27	"	"	"	07/10/06	6010B/SOP503
Cadmium	7.2		1.4	"	"	"	07/10/06	6010B/SOP503
Calcium	5600		270	"	"	"	07/10/06	6010B/SOP503
Chromium	580		2.7	"	"	"	07/10/06	6010B/SOP503
Cobalt	13		5.4	"	"	"	"	6010B/SOP503
Copper	3400		11	"	"	"	07/10/06	6010B/SOP503
Iron	11000		270	"	"	"	"	6010B/SOP503
Lead	330		4.1	"	"	"	07/10/06	6010B/SOP503
Magnesium	55000		140	"	"	"	07/10/06	6010B/SOP503
Manganese	1800		14	"	"	"	"	6010B/SOP503
Molybdenum	19		14	"	"	"	07/10/06	6010B/SOP503
Nickel	270		14	"	"	"	"	6010B/SOP503
Potassium	5000		1400	"	"	"	07/10/06	6010B/SOP503
Selenium	4.6		2.7	"	"	"	07/10/06	6010B/SOP503
Silver	5.2		2.7	"	"	"	"	6010B/SOP503
Sodium	4300		140	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	14	"	"	"	07/10/06	6010B/SOP503
Vanadium	56		5.4	"	"	"	"	6010B/SOP503
Zinc	2700		43	"	"	"	07/12/06	6010B/SOP503
% Solids	74		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-19						Solid - Sampled: 06/24/06 10:30		
Sample ID: MY2JN8						Metals by EPA 6000/7000 Series Methods		
Mercury	ND	U	0.032	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	170000		260	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	26	"	"	"	07/12/06	6010B/SOP503
Arsenic	12		2.6	"	"	"	07/10/06	6010B/SOP503
Barium	800		13	"	"	"	07/10/06	6010B/SOP503
Beryllium	8.2		0.26	"	"	"	07/10/06	6010B/SOP503
Boron	200		26	"	"	"	07/10/06	6010B/SOP503
Cadmium	2.8		1.3	"	"	"	"	6010B/SOP503



United States Environmental Protection Agency
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Project: Halaco Integrated Assessment

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SDG: 06181C
Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-19						Solid - Sampled: 06/24/06 10:30		
Sample ID: MY2JN8						Metals by EPA 6000/7000 Series Methods		
Calcium	3200		260	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Chromium	730		2.6	"	"	"	"	6010B/SOP503
Cobalt	11		5.1	"	"	"	"	6010B/SOP503
Copper	3800		10	"	"	"	"	6010B/SOP503
Iron	28000		260	"	"	"	"	6010B/SOP503
Lead	190		3.8	"	"	"	07/10/06	6010B/SOP503
Magnesium	90000		130	"	"	"	07/10/06	6010B/SOP503
Manganese	6500		13	"	"	"	"	6010B/SOP503
Molybdenum	39		13	"	"	"	"	6010B/SOP503
Nickel	540		13	"	"	"	"	6010B/SOP503
Potassium	2400		1300	"	"	"	"	6010B/SOP503
Selenium	ND	U	2.6	"	"	"	07/10/06	6010B/SOP503
Silver	12		2.6	"	"	"	"	6010B/SOP503
Sodium	3900		130	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	13	"	"	"	07/10/06	6010B/SOP503
Vanadium	73		5.1	"	"	"	07/10/06	6010B/SOP503
Zinc	4400		41	"	"	"	07/12/06	6010B/SOP503
% Solids	78		0	%	B6G0018	07/07/06	07/10/06	% calculation

Lab ID: 0606057-20						Solid - Sampled: 06/24/06 10:44		
Sample ID: MY2JN9						Metals by EPA 6000/7000 Series Methods		
Mercury	0.064		0.043	mg/kg dry	B6G0028	07/08/06	07/08/06	7473/SOP535
Aluminum	150000		340	"	B6G0015	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	34	"	"	"	07/12/06	6010B/SOP503
Arsenic	8.0		3.4	"	"	"	07/10/06	6010B/SOP503
Barium	5100		17	"	"	"	07/10/06	6010B/SOP503
Beryllium	17		0.34	"	"	"	07/10/06	6010B/SOP503
Boron	220		34	"	"	"	07/10/06	6010B/SOP503
Cadmium	8.3		1.7	"	"	"	"	6010B/SOP503
Calcium	6700		340	"	"	"	"	6010B/SOP503
Chromium	320		3.4	"	"	"	"	6010B/SOP503
Cobalt	ND	U	6.9	"	"	"	"	6010B/SOP503
Copper	2200		14	"	"	"	"	6010B/SOP503
Iron	7500		340	"	"	"	"	6010B/SOP503
Lead	330		5.2	"	"	"	07/10/06	6010B/SOP503
Magnesium	80000		170	"	"	"	07/10/06	6010B/SOP503
Manganese	1700		17	"	"	"	"	6010B/SOP503
Molybdenum	14	C1, J	17	"	"	"	"	6010B/SOP503
Nickel	130		17	"	"	"	"	6010B/SOP503
Potassium	11000		1700	"	"	"	"	6010B/SOP503
Selenium	5.2		3.4	"	"	"	07/10/06	6010B/SOP503
Silver	5.2		3.4	"	"	"	"	6010B/SOP503
Sodium	11000		170	"	"	"	07/10/06	6010B/SOP503
Thallium	ND	U	17	"	"	"	07/10/06	6010B/SOP503



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SDG: 06181C

Reported: 07/19/06 10:23

Sample Results

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606057-20						Solid - Sampled: 06/24/06 10:44		
Sample ID: MY2JN9						Metals by EPA 6000/7000 Series Methods		
Vanadium	59		6.9	mg/kg dry	B6G0015	07/06/06	07/10/06	6010B/SOP503
Zinc	1700		14	"	"	"	"	6010B/SOP503
% Solids	58		0	%	B6G0018	07/07/06	07/10/06	% calculation



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R9Q

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Prepared: 07/06/06 Analyzed: 07/10/06

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch B6G0015 - 3050B Sld Acid Dig -

Metals, ICP

Blank (B6G0015-BLK1)

Aluminum	ND	U	200	mg/kg wet
Antimony	ND	U	20	"
Arsenic	ND	U	2.0	"
Barium	ND	U	10	"
Beryllium	ND	U	0.20	"
Boron	ND	U	20	"
Cadmium	ND	U	1.0	"
Calcium	ND	U	200	"
Chromium	ND	U	2.0	"
Cobalt	ND	U	4.0	"
Copper	ND	U	8.0	"
Iron	ND	U	200	"
Lead	ND	U	3.0	"
Magnesium	ND	U	100	"
Manganese	ND	U	10	"
Molybdenum	ND	U	10	"
Nickel	ND	U	10	"
Potassium	ND	U	1000	"
Selenium	ND	U	2.0	"
Silver	ND	U	2.0	"
Sodium	ND	U	100	"
Thallium	ND	U	10	"
Vanadium	ND	U	4.0	"
Zinc	ND	U	8.0	"

Matrix Spike (B6G0015-MS1)

Source: 0606057-03

Aluminum	125000	Q10	220	mg/kg dry	445	118000	NR	75-125	20
Antimony	67.1	Q4	22	"	111	ND	60	75-125	20
Arsenic	406		2.2	"	445	5.41	90	75-125	20
Barium	3710		11	"	445	3170	121	75-125	20
Beryllium	76.7		0.22	"	11.1	65.2	104	75-125	20
Boron	450		22	"	445	62.2	87	75-125	20
Cadmium	15.2		1.1	"	11.1	5.76	85	75-125	20
Calcium	9460	Q10	220	"	2220	10200	NR	75-125	20
Chromium	307	Q10	2.2	"	44.5	353	NR	75-125	20
Cobalt	89.8		4.5	"	111	4.04	77	75-125	20
Copper	2500	Q10	9.0	"	55.6	2780	NR	75-125	20
Iron	11200	Q10	220	"	222	19800	NR	75-125	20
Lead	265		3.4	"	111	172	84	75-125	20
Magnesium	104000	Q10	110	"	2220	100000	180	75-125	20
Manganese	3990	Q10	11	"	111	3940	45	75-125	20
Molybdenum	111		11	"	111	16.0	86	75-125	20
Nickel	265	Q4	11	"	111	196	62	75-125	20
Potassium	4160		1100	"	2220	1620	114	75-125	20
Selenium	382		2.2	"	445	ND	86	75-125	20



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Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Prepared: 07/06/06 Analyzed: 07/10/06

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch B6G0015 - 3050B Sld Acid Dig -

Metals, ICP

Matrix Spike (B6G0015-MS1)

Source: 0606057-03

Silver	20.7		2.2	"	11.1	8.93	106	75-125		20
Sodium	2950		110	"	2220	730	100	75-125		20
Thallium	357		11	"	445	ND	80	75-125		20
Vanadium	132		4.5	"	111	32.3	90	75-125		20
Zinc	2550	Q10	36	"	111	2500	45	75-125		20

Matrix Spike Dup (B6G0015-MSD1)

Source: 0606057-03

Aluminum	107000	Q10	220	mg/kg dry	428	118000	NR	75-125	16	20
Antimony	65.4	Q4	22	"	107	ND	61	75-125	3	20
Arsenic	388		2.2	"	428	5.41	89	75-125	5	20
Barium	3700		11	"	428	3170	124	75-125	0.3	20
Beryllium	82.9	Q10	0.22	"	10.7	65.2	165	75-125	8	20
Boron	434		22	"	428	62.2	87	75-125	4	20
Cadmium	14.1		1.1	"	10.7	5.76	78	75-125	8	20
Calcium	9400	Q10	220	"	2140	10200	NR	75-125	0.6	20
Chromium	381	Q6	2.2	"	42.8	353	65	75-125	22	20
Cobalt	88.0		4.5	"	107	4.04	78	75-125	2	20
Copper	2620	Q10	9.0	"	53.5	2780	NR	75-125	5	20
Iron	15000	Q10, Q6	220	"	214	19800	NR	75-125	29	20
Lead	244	Q4	3.4	"	107	172	67	75-125	8	20
Magnesium	112000	Q10	110	"	2140	100000	561	75-125	7	20
Manganese	4350	Q10	11	"	107	3940	383	75-125	9	20
Molybdenum	109		11	"	107	16.0	87	75-125	2	20
Nickel	310		11	"	107	196	107	75-125	16	20
Potassium	3560		1100	"	2140	1620	91	75-125	16	20
Selenium	368		2.2	"	428	ND	86	75-125	4	20
Silver	18.4		2.2	"	10.7	8.93	89	75-125	12	20
Sodium	2680		110	"	2140	730	91	75-125	10	20
Thallium	340		11	"	428	ND	79	75-125	5	20
Vanadium	127		4.5	"	107	32.3	89	75-125	4	20
Zinc	2430	Q10	36	"	107	2500	NR	75-125	5	20

Reference (B6G0015-SRM1)

Aluminum	319		200	mg/kg wet	309		103	62.49-137
Antimony	243		20	"	213		114	60.75-140
Arsenic	1090		2.0	"	930		117	65.98-134
Barium	5.23	C1, J	10	"	5.30		99	47.17-153
Beryllium	19.8		0.20	"	18.8		105	81.38-118
Cadmium	41.2		1.0	"	41.6		99	77.16-123
Calcium	174000		200	"	184000		95	77.68-122
Chromium	104		2.0	"	96.5		108	80.06-119
Cobalt	138		4.0	"	140		99	82.42-118
Copper	6120		8.0	"	6680		92	85.73-114
Iron	22800		200	"	21000		109	80.14-120
Lead	218		3.0	"	224		97	74.82-125
Magnesium	100000		100	"	113000		88	86.28-114
Manganese	205		10	"	201		102	83.53-117



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:23

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Prepared: 07/06/06 Analyzed: 07/10/06

**Batch B6G0015 - 3050B Sld Acid Dig -
Metals, ICP**

Metals by EPA 6000/7000 Series Methods - Quality Control

Reference (B6G0015-SRM1)

Nickel	58.1		10	"	56.8		102	76.58-123		
Potassium	ND	U	1000	"	102			0-370		
Selenium	44.2		2.0	"	37.0		119	47.57-152		
Silver	27.0		2.0	"	20.9		129	63.16-136		
Sodium	ND	U	100	"	92.8			0-299		
Thallium	37.0		10	"	38.1		97	64.57-135		
Vanadium	71.0		4.0	"	65.8		108	80.55-119		
Zinc	175		8.0	"	175		100	72.97-127		

Prepared: 07/07/06 Analyzed: 07/10/06

**Batch B6G0018 - Solids, Dry Weight
(Prep) - Solids, Dry Weight
Blank (B6G0018-BLK1)**

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

% Solids	ND	U	0	%						
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Duplicate (B6G0018-DUP1)

Source: 0606057-01

% Solids	91		0	%		91			0	20
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Prepared & Analyzed: 07/08/06

Batch B6G0028 - 7473 Hg Prep -

Metals by EPA 6000/7000 Series Methods - Quality Control

Mercury

Blank (B6G0028-BLK1)

Mercury	ND	U	0.025	mg/kg wet						
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Matrix Spike (B6G0028-MS1)

Source: 0606057-03

Mercury	0.363		0.028	mg/kg dry	0.327	0.0668	91	80-120		20
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Matrix Spike Dup (B6G0028-MSD1)

Source: 0606057-03

Mercury	0.382		0.028	mg/kg dry	0.354	0.0668	89	80-120	2	20
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Reference (B6G0028-SRM1)

Mercury	0.424		0.025	mg/kg wet	0.447		95	80-120		
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United States Environmental Protection Agency
Region 9 Laboratory

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Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Matthew Mitguard

Project Number: R06S73

Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office

75 Hawthorne Street

San Francisco CA, 94105

SDG: 06181C

Reported: 07/19/06 10:23

Qualifiers and Comments

Q6	Matrix spike/matrix spike duplicate precision criteria were not met for this analyte (see MS/MSD results for this batch in QC summary).
Q4	The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)
Q10	The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.
J	The reported result for this analyte should be considered an estimated value.
C1	The reported concentration for this analyte is below the quantitation limit.
U	Not Detected
NR	Not Reported



**United States Environmental Protection Agency
Region 9 Laboratory**

**1337 S. 46th Street Building 201
Richmond, CA 94804**

**Subject: Analytical Testing Results - Project R06S73
SDG: 06181D**

**From: Brenda Bettencourt, Director
EPA Region 9 Laboratory
MTS-2**

**To: Matthew Mitguard
States, Tribes and Site Assessment Office
SFD-9-1**

A33tache tdh 3ch dhru3r ldfo 3ch tmtunryr fl rtoiuhr ldfo 3ch **Halaco Integrated
Assessment** idfpha3j .chrh et3t ctTh vhhm dhTyhbhe ym taafdetmah by3c wEA PhRyfm 2
Ltvfdt3fdn ifuyanj

A lsuu efasohm3t3yfm itagtRh lfd 3chrh et3tk ymauseymR dtb et3t tme rtoiuhr asr3fen
efasohm3t3yfmk yr fm lyuh t3 3ch wEA PhRyfm 2 Ltvfdt3fdnj Il nfs bfsue uygh 3f dh,shr3
teey3yfntu dhTyhb tmeqfd Ttuyet3yfm fl 3ch et3tk iuhtrh afm3ta3 wsRhmyt /aNtsRc3fm t3 3ch
PhRyfm 2 Mstuy3n Arrsdtmah Qllyahj

Il nfs ctTh tmn ,shr3yfmrk iuhtrh trg lfd Pyactde Otshdk 3ch Ltv Edfpha3
/tmtRhd t3 B590()94-4C00j

Analyses included in this

/hdasdn
Dfuyerk Wdn 8hyRc3

/h3turk ISE



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
MYJ450	0606028-01	Solid	06/JJ/06 12:K2	06/30/06 07:32
MYJ451	0606028-0J	Solid	06/JJ/06 16:22	06/30/06 07:32
MYJ45J	0606028-03	Solid	06/JK/06 12:37	06/30/06 07:32
MYJ453	0606028-0K	Solid	06/JJ/06 1J:22	06/30/06 07:32
MYJ45K	0606028-02	Solid	06/JJ/06 13:22	06/30/06 07:32
MYJ452	0606028-06	Solid	06/J6/06 10:K6	06/30/06 07:32
MYJ456	0606028-07	Solid	06/J6/06 10:1J	06/30/06 07:32
MYJ457	0606028-08	Solid	06/J6/06 09:32	06/30/06 07:32
MYJ458	0606028-09	Solid	06/J6/06 08:21	06/30/06 07:32
MYJ459	0606028-10	Solid	06/J6/06 11:30	06/30/06 07:32
MYJ4N0	0606028-11	Solid	06/J6/06 1K:1K	06/30/06 07:32
MYJ4NJ	0606028-1J	Solid	06/J6/06 1J:KJ	06/30/06 07:32
MYJ4N3	0606028-13	Solid	06/J6/06 13:J2	06/30/06 07:32
MYJ4R7	0606028-1K	Solid	06/J7/06 11:00	06/30/06 07:32
MYJ4S6	0606028-12	Solid	06/J7/06 16:J8	06/30/06 07:32
MYJ4S7	0606028-16	Solid	06/J8/06 10:J8	06/30/06 07:32
MYJ4S8	0606028-17	Solid	06/J8/06 09:0K	06/30/06 07:32
MYJ4S9	0606028-18	Solid	06/J7/06 12:J3	06/30/06 07:32
MYJ4L0	0606028-19	Solid	06/J7/06 1K:12	06/30/06 07:32
MYJ4L1	0606028-J0	Solid	06/J7/06 13:09	06/30/06 07:32

.ch rtoiuhr bhdh ctme-ehuyThdhe 3f 3ch utvfdt3fdn t3 40 ehRdhhr Shurysrj



United States Environmental Protection Agency Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NualiPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.01 Solid - Samzled: 06/JJ/06 12:K2								
Sample ID: MY2JP0 Metals bf E5A 6000/7000 Series Methods								
Mercury	ND	U	03082	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	2-0000		1000	"	p6G0016	07/06/06	07/1J/06	6010p/SO5203
Antimony	ND	U	26	"	"	"	07/1J/06	6010p/SO5203
Arsenic	530		236	"	"	"	07/10/06	6010p/SO5203
Barium	8-0		18	"	"	"	07/10/06	6010p/SO5203
Beryllium	938		0326	"	"	"	07/10/06	6010p/SO5203
Boron	1-0		26	"	"	"	07/10/06	6010p/SO5203
Cadmium	438		138	"	"	"	"	6010p/SO5203
Calcium	11000		260	"	"	"	"	6010p/SO5203
Chromium	540		236	"	"	"	"	6010p/SO5203
Cobalt	730		532	"	"	"	"	6010p/SO5203
Copper	6500		10	"	"	"	"	6010p/SO5203
Iron	-400		260	"	"	"	"	6010p/SO5203
Lead	280		839	"	"	"	07/10/06	6010p/SO5203
Magnesium	88000	J, A.01	180	"	"	"	07/10/06	6010p/SO5203
Manganese	1600		18	"	"	"	"	6010p/SO5203
Molybdenum	28		18	"	"	"	"	6010p/SO5203
Nickel	460		18	"	"	"	"	6010p/SO5203
Potassium	1400		1800	"	"	"	"	6010p/SO5203
Selenium	ND	U	236	"	"	"	07/10/06	6010p/SO5203
Silver	834	A.01, J	236	"	"	"	"	6010p/SO5203
Sodium	760		180	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	18	"	"	"	07/10/06	6010p/SO5203
Vanadium	67		532	"	"	"	07/10/06	6010p/SO5203
Zinc	4000		42	"	"	"	07/1J/06	6010p/SO5203
% Solids	77		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.02 Solid - Samzled: 06/JJ/06 16:22								
Sample ID: MY2JP1 Metals bf E5A 6000/7000 Series Methods								
Mercury	ND	U	03082	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	290000		1000	"	p6G0016	07/06/06	07/1J/06	6010p/SO5203
Antimony	ND	U	26	"	"	"	07/1J/06	6010p/SO5203
Arsenic	43-		236	"	"	"	07/10/06	6010p/SO5203
Barium	490		18	"	"	"	"	6010p/SO5203
Beryllium	1-		0326	"	"	"	"	6010p/SO5203
Boron	140		26	"	"	"	"	6010p/SO5203
Cadmium	734		138	"	"	"	"	6010p/SO5203
Calcium	6000		260	"	"	"	"	6010p/SO5203
Chromium	760		236	"	"	"	"	6010p/SO5203
Cobalt	12		531	"	"	"	"	6010p/SO5203
Copper	-700		10	"	"	"	"	6010p/SO5203
Iron	12000		260	"	"	"	"	6010p/SO5203
Lead	4-0		83-	"	"	"	"	6010p/SO5203
Magnesium	25000	J, A.01	180	"	"	"	"	6010p/SO5203



United States Environmental Protection Agency Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NuallPiers / Qomments	Nuantitation Uimit	Bnits	patch	Srezared	Analfyed	Method
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Lab ID: 060605-.02

Solid - Samzled: 06/JJ/06 16:22

Sample ID: MY2JP1

Metals bf E5A 6000/7000 Series Methods

Manganese	1-00		18	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Molybdenum	88		18	"	"	"	"	6010p/SO5203
Nickel	570		18	"	"	"	"	6010p/SO5203
Potassium	7400		1800	"	"	"	"	6010p/SO5203
Selenium	ND	U	236	"	"	"	"	6010p/SO5203
Silver	63-	A.01, J	236	"	"	"	"	6010p/SO5203
Sodium	1500		180	"	"	"	"	6010p/SO5203
Thallium	ND	U	18	"	"	"	"	6010p/SO5203
Vanadium	79		531	"	"	"	"	6010p/SO5203
Zinc	4900		41	"	"	"	07/1J/06	6010p/SO5203
% Solids	7-		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.08

Solid - Samzled: 06/JK/06 12:37

Sample ID: MY2JP2

Metals bf E5A 6000/7000 Series Methods

Mercury	ND	U	03051	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	79000		410	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	41	"	"	"	07/1J/06	6010p/SO5203
Arsenic	235	C1, J	431	"	"	"	07/10/06	6010p/SO5203
Barium	19000		-2	"	"	"	07/1J/06	6010p/SO5203
Beryllium	95		0341	"	"	"	07/10/06	6010p/SO5203
Boron	180		41	"	"	"	07/10/06	6010p/SO5203
Cadmium	538		230	"	"	"	"	6010p/SO5203
Calcium	5800		410	"	"	"	"	6010p/SO5203
Chromium	110		431	"	"	"	"	6010p/SO5203
Cobalt	ND	U	-32	"	"	"	"	6010p/SO5203
Copper	2600		16	"	"	"	"	6010p/SO5203
Iron	5100		410	"	"	"	"	6010p/SO5203
Lead	-1		631	"	"	"	07/10/06	6010p/SO5203
Magnesium	190000	J, A.01	200	"	"	"	07/10/06	6010p/SO5203
Manganese	5000		20	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	20	"	"	"	"	6010p/SO5203
Nickel	-7		20	"	"	"	"	6010p/SO5203
Potassium	-200		2000	"	"	"	"	6010p/SO5203
Selenium	ND	U	431	"	"	"	07/10/06	6010p/SO5203
Silver	438	A.01, J	431	"	"	"	"	6010p/SO5203
Sodium	6400		200	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	20	"	"	"	07/10/06	6010p/SO5203
Vanadium	81		-32	"	"	"	07/10/06	6010p/SO5203
Zinc	1200		16	"	"	"	"	6010p/SO5203
% Solids	49		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.04

Solid - Samzled: 06/JJ/06 1J:22

Sample ID: MY2JP8

Metals bf E5A 6000/7000 Series Methods

Mercury	ND	U	03051	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
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United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NuallPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.04 Solid - Samzled: 06/JJ/06 13:22								
Sample ID: MY2JP8 Metals bf E5A 6000/7000 Series Methods								
Aluminum	6-000		410	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	41	"	"	"	07/11/06	6010p/SO5203
Arsenic	230	C1, J	431	"	"	"	07/10/06	6010p/SO5203
Barium	11000		20	"	"	"	07/10/06	6010p/SO5203
Beryllium	76		0341	"	"	"	07/10/06	6010p/SO5203
Boron	120		41	"	"	"	07/10/06	6010p/SO5203
Cadmium	23-		230	"	"	"	"	6010p/SO5203
Calcium	8500		410	"	"	"	"	6010p/SO5203
Chromium	140		431	"	"	"	"	6010p/SO5203
Cobalt	ND	U	-32	"	"	"	"	6010p/SO5203
Copper	1000		16	"	"	"	07/11/06	6010p/SO5203
Iron	4400		410	"	"	"	07/10/06	6010p/SO5203
Lead	-0		631	"	"	"	07/11/06	6010p/SO5203
Magnesium	190000	J, A.01	200	"	"	"	07/10/06	6010p/SO5203
Manganese	5600		20	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	20	"	"	"	"	6010p/SO5203
Nickel	61		20	"	"	"	"	6010p/SO5203
Potassium	-200		2000	"	"	"	"	6010p/SO5203
Selenium	ND	U	431	"	"	"	07/10/06	6010p/SO5203
Silver	537	A.01, J	431	"	"	"	"	6010p/SO5203
Sodium	-200		200	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	20	"	"	"	07/10/06	6010p/SO5203
Vanadium	25		-32	"	"	"	07/10/06	6010p/SO5203
Zinc	1100		16	"	"	"	"	6010p/SO5203
% Solids	49		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.05 Solid - Samzled: 06/JJ/06 13:22								
Sample ID: MY2JP4 Metals bf E5A 6000/7000 Series Methods								
Mercury	03084	C1, J	03052	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	-5000		420	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	42	"	"	"	07/11/06	6010p/SO5203
Arsenic	19		432	"	"	"	07/10/06	6010p/SO5203
Barium	2400		21	"	"	"	07/10/06	6010p/SO5203
Beryllium	14		0342	"	"	"	07/10/06	6010p/SO5203
Boron	260		42	"	"	"	07/10/06	6010p/SO5203
Cadmium	431		231	"	"	"	"	6010p/SO5203
Calcium	8600		420	"	"	"	"	6010p/SO5203
Chromium	170		432	"	"	"	"	6010p/SO5203
Cobalt	ND	U	-38	"	"	"	"	6010p/SO5203
Copper	1700		17	"	"	"	07/11/06	6010p/SO5203
Iron	5400		420	"	"	"	07/10/06	6010p/SO5203
Lead	280		632	"	"	"	07/11/06	6010p/SO5203
Magnesium	170000	J, A.01	210	"	"	"	07/10/06	6010p/SO5203
Manganese	1900		21	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	21	"	"	"	"	6010p/SO5203



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analfte	Result	NualiPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
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Lab ID: 060605-.05

Solid - Samzled: 06/JJ/06 13:22

Sample ID: MY2JP4

Metals bf E5A 6000/7000 Series Methods

Nickel	74		21	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Potassium	7500		2100	"	"	"	"	6010p/SO5203
Selenium	ND	U	432	"	"	"	07/10/06	6010p/SO5203
Silver	739	A.01, J	432	"	"	"	"	6010p/SO5203
Sodium	11000		210	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	21	"	"	"	07/10/06	6010p/SO5203
Vanadium	29		-38	"	"	"	07/10/06	6010p/SO5203
Zinc	2000		17	"	"	"	"	6010p/SO5203
% Solids	4-		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.06

Solid - Samzled: 06/J6/06 10:K6

Sample ID: MY2JP5

Metals bf E5A 6000/7000 Series Methods

Mercury	ND	U	03080	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	200000		240	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	1-	C1, J	24	"	"	"	07/11/06	6010p/SO5203
Arsenic	430		234	"	"	"	07/10/06	6010p/SO5203
Barium	580		12	"	"	"	07/10/06	6010p/SO5203
Beryllium	737		0324	"	"	"	07/10/06	6010p/SO5203
Boron	94		24	"	"	"	07/10/06	6010p/SO5203
Cadmium	15		132	"	"	"	"	6010p/SO5203
Calcium	12000		240	"	"	"	"	6010p/SO5203
Chromium	640		234	"	"	"	"	6010p/SO5203
Cobalt	735		43-	"	"	"	"	6010p/SO5203
Copper	12000		89	"	"	"	07/1J/06	6010p/SO5203
Iron	25000		240	"	"	"	07/10/06	6010p/SO5203
Lead	1100		836	"	"	"	07/11/06	6010p/SO5203
Magnesium	88000	J, A.01	120	"	"	"	07/10/06	6010p/SO5203
Manganese	2700		12	"	"	"	"	6010p/SO5203
Molybdenum	94		12	"	"	"	"	6010p/SO5203
Nickel	890		12	"	"	"	"	6010p/SO5203
Potassium	22000		4-00	"	"	"	07/1J/06	6010p/SO5203
Selenium	234		234	"	"	"	07/10/06	6010p/SO5203
Silver	2-	A.01, J	234	"	"	"	"	6010p/SO5203
Sodium	12000		120	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	12	"	"	"	07/10/06	6010p/SO5203
Vanadium	-4		43-	"	"	"	07/10/06	6010p/SO5203
Zinc	6-00		89	"	"	"	07/1J/06	6010p/SO5203
% Solids	-8		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.07

Solid - Samzled: 06/J6/06 10:1J

Sample ID: MY2JP6

Metals bf E5A 6000/7000 Series Methods

Mercury	03082	C1, J	03048	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	160000		840	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	84	"	"	"	07/11/06	6010p/SO5203



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NuallPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.07 Solid - Samzled: 06/J6/06 10:1J								
Sample ID: MY2JP6 Metals bf E5A 6000/7000 Series Methods								
Arsenic	12		834	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Barium	1400		17	"	"	"	07/10/06	6010p/SO5203
Beryllium	81		0384	"	"	"	07/10/06	6010p/SO5203
Boron	190		84	"	"	"	07/10/06	6010p/SO5203
Cadmium	531		137	"	"	"	"	6010p/SO5203
Calcium	8400		840	"	"	"	"	6010p/SO5203
Chromium	190		834	"	"	"	"	6010p/SO5203
Cobalt	ND	U	639	"	"	"	"	6010p/SO5203
Copper	1800		14	"	"	"	07/11/06	6010p/SO5203
Iron	5800		840	"	"	"	07/10/06	6010p/SO5203
Lead	180		532	"	"	"	07/11/06	6010p/SO5203
Magnesium	-6000	J, A.01	170	"	"	"	07/10/06	6010p/SO5203
Manganese	2000		17	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	17	"	"	"	"	6010p/SO5203
Nickel	70		17	"	"	"	"	6010p/SO5203
Potassium	5-00		1700	"	"	"	"	6010p/SO5203
Selenium	ND	U	834	"	"	"	07/10/06	6010p/SO5203
Silver	236	C1, A.01, J	834	"	"	"	"	6010p/SO5203
Sodium	-900		170	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	17	"	"	"	07/10/06	6010p/SO5203
Vanadium	70		639	"	"	"	07/10/06	6010p/SO5203
Zinc	1200		14	"	"	"	"	6010p/SO5203
% Solids	5-		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.0- Solid - Samzled: 06/J6/06 09:32								
Sample ID: MY2JP7 Metals bf E5A 6000/7000 Series Methods								
Mercury	03067		03051	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	140000		410	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	41	"	"	"	07/11/06	6010p/SO5203
Arsenic	-3-		431	"	"	"	07/10/06	6010p/SO5203
Barium	2100		20	"	"	"	07/10/06	6010p/SO5203
Beryllium	930		0341	"	"	"	07/10/06	6010p/SO5203
Boron	240		41	"	"	"	07/10/06	6010p/SO5203
Cadmium	432		230	"	"	"	"	6010p/SO5203
Calcium	1600		410	"	"	"	"	6010p/SO5203
Chromium	840		431	"	"	"	"	6010p/SO5203
Cobalt	630	C1, J	-32	"	"	"	"	6010p/SO5203
Copper	2100		16	"	"	"	07/11/06	6010p/SO5203
Iron	6800		410	"	"	"	07/10/06	6010p/SO5203
Lead	850		631	"	"	"	07/11/06	6010p/SO5203
Magnesium	54000	J, A.01	200	"	"	"	07/10/06	6010p/SO5203
Manganese	1500		20	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	20	"	"	"	"	6010p/SO5203
Nickel	180		20	"	"	"	"	6010p/SO5203



United States Environmental Protection Agency Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analte	Result	NualiPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
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Lab ID: 060605-.0-

Solid - Samzled: 06/J6/06 09:32

Sample ID: MY2JP7

Metals bf E5A 6000/7000 Series Methods

Potassium	6-00		2000	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Selenium	ND	U	431	"	"	"	07/10/06	6010p/SO5203
Silver	234	C1, A.01, J	431	"	"	"	"	6010p/SO5203
Sodium	12000		200	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	20	"	"	"	07/10/06	6010p/SO5203
Vanadium	5-		-32	"	"	"	07/10/06	6010p/SO5203
Zinc	1700		16	"	"	"	"	6010p/SO5203
% Solids	49		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.09

Solid - Samzled: 06/J6/06 08:21

Sample ID: MY2JP-

Metals bf E5A 6000/7000 Series Methods

Mercury	0319		03044	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	180000		850	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	85	"	"	"	07/11/06	6010p/SO5203
Arsenic	14		835	"	"	"	07/10/06	6010p/SO5203
Barium	4500		1-	"	"	"	07/10/06	6010p/SO5203
Beryllium	2-		0385	"	"	"	"	6010p/SO5203
Boron	170		85	"	"	"	"	6010p/SO5203
Cadmium	534		13-	"	"	"	"	6010p/SO5203
Calcium	8700		850	"	"	"	"	6010p/SO5203
Chromium	210		835	"	"	"	"	6010p/SO5203
Cobalt	ND	U	730	"	"	"	"	6010p/SO5203
Copper	1200		14	"	"	"	07/11/06	6010p/SO5203
Iron	6100		850	"	"	"	07/10/06	6010p/SO5203
Lead	170		538	"	"	"	07/11/06	6010p/SO5203
Magnesium	110000	J, A.01	1-0	"	"	"	07/10/06	6010p/SO5203
Manganese	2100		1-	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	1-	"	"	"	"	6010p/SO5203
Nickel	65		1-	"	"	"	"	6010p/SO5203
Potassium	5800		1-00	"	"	"	"	6010p/SO5203
Selenium	ND	U	835	"	"	"	07/10/06	6010p/SO5203
Silver	831	C1, A.01, J	835	"	"	"	07/10/06	6010p/SO5203
Sodium	9000		1-0	"	"	"	"	6010p/SO5203
Thallium	ND	U	1-	"	"	"	07/10/06	6010p/SO5203
Vanadium	56		730	"	"	"	07/10/06	6010p/SO5203
Zinc	1400		14	"	"	"	"	6010p/SO5203
% Solids	57		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.10

Solid - Samzled: 06/J6/06 11:30

Sample ID: MY2JP9

Metals bf E5A 6000/7000 Series Methods

Mercury	ND	U	03051	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	85000		410	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	41	"	"	"	07/11/06	6010p/SO5203
Arsenic	ND	U	431	"	"	"	07/10/06	6010p/SO5203



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NuallPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.10 Solid - Samzled: 06/J6/06 11:30								
Sample ID: MY2JP9 Metals bf E5A 6000/7000 Series Methods								
Barium	1-000		-2	mg/kg drf	p6G0016	07/06/06	07/11/06	6010p/SO5203
Beryllium	96		0341	"	"	"	07/10/06	6010p/SO5203
Boron	210		41	"	"	"	07/10/06	6010p/SO5203
Cadmium	239		230	"	"	"	"	6010p/SO5203
Calcium	5500		410	"	"	"	"	6010p/SO5203
Chromium	44		431	"	"	"	"	6010p/SO5203
Cobalt	ND	U	-32	"	"	"	"	6010p/SO5203
Copper	850		16	"	"	"	07/11/06	6010p/SO5203
Iron	8-00		410	"	"	"	07/10/06	6010p/SO5203
Lead	89		631	"	"	"	07/11/06	6010p/SO5203
Magnesium	280000	J, A.01	200	"	"	"	07/10/06	6010p/SO5203
Manganese	5500		20	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	20	"	"	"	"	6010p/SO5203
Nickel	1-	C1, J	20	"	"	"	"	6010p/SO5203
Potassium	8100		2000	"	"	"	"	6010p/SO5203
Selenium	ND	U	431	"	"	"	07/10/06	6010p/SO5203
Silver	434	A.01, J	431	"	"	"	"	6010p/SO5203
Sodium	4800		200	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	20	"	"	"	07/10/06	6010p/SO5203
Vanadium	12		-32	"	"	"	07/10/06	6010p/SO5203
Zinc	760		16	"	"	"	"	6010p/SO5203
% Solids	49		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.11 Solid - Samzled: 06/J6/06 1K:1K								
Sample ID: MY2JK0 Metals bf E5A 6000/7000 Series Methods								
Mercury	ND	U	03058	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	51000		480	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	48	"	"	"	07/11/06	6010p/SO5203
Arsenic	ND	U	438	"	"	"	07/10/06	6010p/SO5203
Barium	16000		21	"	"	"	07/10/06	6010p/SO5203
Beryllium	92		0348	"	"	"	07/10/06	6010p/SO5203
Boron	170		48	"	"	"	07/10/06	6010p/SO5203
Cadmium	536		231	"	"	"	"	6010p/SO5203
Calcium	6200		480	"	"	"	"	6010p/SO5203
Chromium	-8		438	"	"	"	"	6010p/SO5203
Cobalt	ND	U	-35	"	"	"	"	6010p/SO5203
Copper	780		17	"	"	"	07/11/06	6010p/SO5203
Iron	4000		480	"	"	"	07/10/06	6010p/SO5203
Lead	-6		634	"	"	"	07/11/06	6010p/SO5203
Magnesium	200000	J, A.01	210	"	"	"	07/10/06	6010p/SO5203
Manganese	5400		21	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	21	"	"	"	"	6010p/SO5203
Nickel	81		21	"	"	"	"	6010p/SO5203
Potassium	4900		2100	"	"	"	"	6010p/SO5203
Selenium	ND	U	438	"	"	"	07/10/06	6010p/SO5203



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NuallPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.11 Solid - Samzled: 06/J6/06 1K:1K								
Sample ID: MY2JK0 Metals bf E5A 6000/7000 Series Methods								
Silver	438	A.01, J	438	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Sodium	7400		210	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	21	"	"	"	07/10/06	6010p/SO5203
Vanadium	19		-35	"	"	"	07/10/06	6010p/SO5203
Zinc	940		17	"	"	"	"	6010p/SO5203
% Solids	47		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.12 Solid - Samzled: 06/J6/06 1J:KJ								
Sample ID: MY2JK2 Metals bf E5A 6000/7000 Series Methods								
Mercury	ND	U	03080	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	26000		240	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	24	"	"	"	07/11/06	6010p/SO5203
Arsenic	ND	U	234	"	"	"	07/10/06	6010p/SO5203
Barium	810		12	"	"	"	07/10/06	6010p/SO5203
Beryllium	70		0324	"	"	"	07/10/06	6010p/SO5203
Boron	1-	C1, J	24	"	"	"	07/10/06	6010p/SO5203
Cadmium	ND	U	132	"	"	"	"	6010p/SO5203
Calcium	5400	K4, J	240	"	"	"	"	6010p/SO5203
Chromium	19		234	"	"	"	"	6010p/SO5203
Cobalt	ND	K4, J, U	43-	"	"	"	"	6010p/SO5203
Copper	180	K4, J	936	"	"	"	07/11/06	6010p/SO5203
Iron	5700		240	"	"	"	07/10/06	6010p/SO5203
Lead	-31		836	"	"	"	07/11/06	6010p/SO5203
Magnesium	190000	J, A.01	120	"	"	"	07/10/06	6010p/SO5203
Manganese	4600		12	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	12	"	"	"	"	6010p/SO5203
Nickel	18		12	"	"	"	"	6010p/SO5203
Potassium	82000		4-00	"	"	"	07/1J/06	6010p/SO5203
Selenium	ND	U	234	"	"	"	07/10/06	6010p/SO5203
Silver	534	A.01, J	234	"	"	"	"	6010p/SO5203
Sodium	5600	K4, J	120	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	K4, J, U	12	"	"	"	07/10/06	6010p/SO5203
Vanadium	535		43-	"	"	"	07/10/06	6010p/SO5203
Zinc	550		936	"	"	"	"	6010p/SO5203
% Solids	-8		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.18 Solid - Samzled: 06/J6/06 1J:J2								
Sample ID: MY2JK8 Metals bf E5A 6000/7000 Series Methods								
Mercury	ND	U	03029	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	24000		240	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	24	"	"	"	07/11/06	6010p/SO5203
Arsenic	137	C1, J	234	"	"	"	07/10/06	6010p/SO5203
Barium	9-0		12	"	"	"	07/10/06	6010p/SO5203
Beryllium	120		0324	"	"	"	07/10/06	6010p/SO5203



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NuallPiers / Comments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.18								
Sample ID: MY2JK8								
Solid - Samzled: 06/J6/06 13:J2								
Metals bf E5A 6000/7000 Series Methods								
Boron	81		24	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Cadmium	0359	C1, J	132	"	"	"	"	6010p/SO5203
Calcium	5600		240	"	"	"	"	6010p/SO5203
Chromium	28		234	"	"	"	"	6010p/SO5203
Cobalt	ND	U	437	"	"	"	"	6010p/SO5203
Copper	-0		934	"	"	"	07/11/06	6010p/SO5203
Iron	5800		240	"	"	"	07/10/06	6010p/SO5203
Lead	-39		835	"	"	"	07/11/06	6010p/SO5203
Magnesium	250000	J, A.01	470	"	"	"	07/1J/06	6010p/SO5203
Manganese	6700		12	"	"	"	07/10/06	6010p/SO5203
Molybdenum	ND	U	12	"	"	"	"	6010p/SO5203
Nickel	1-		12	"	"	"	"	6010p/SO5203
Potassium	11000		1200	"	"	"	07/11/06	6010p/SO5203
Selenium	ND	U	234	"	"	"	07/10/06	6010p/SO5203
Silver	-32	A.01, J	234	"	"	"	"	6010p/SO5203
Sodium	5900		120	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	12	"	"	"	07/10/06	6010p/SO5203
Vanadium	11		437	"	"	"	07/10/06	6010p/SO5203
Zinc	550		934	"	"	"	"	6010p/SO5203
% Solids	-5		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.14
Sample ID: MY2JR7

Solid - Samzled: 06/J7/06 11:00
Metals bf E5A 6000/7000 Series Methods

Mercury	0311		03052	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	4-000		420	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	42	"	"	"	07/11/06	6010p/SO5203
Arsenic	ND	U	432	"	"	"	07/10/06	6010p/SO5203
Barium	11000		21	"	"	"	07/10/06	6010p/SO5203
Beryllium	160		0342	"	"	"	07/10/06	6010p/SO5203
Boron	100		42	"	"	"	07/10/06	6010p/SO5203
Cadmium	538		231	"	"	"	"	6010p/SO5203
Calcium	4700		420	"	"	"	"	6010p/SO5203
Chromium	66		432	"	"	"	"	6010p/SO5203
Cobalt	ND	U	-38	"	"	"	"	6010p/SO5203
Copper	600		17	"	"	"	07/11/06	6010p/SO5203
Iron	8200		420	"	"	"	07/10/06	6010p/SO5203
Lead	-		632	"	"	"	07/11/06	6010p/SO5203
Magnesium	220000	J, A.01	210	"	"	"	07/10/06	6010p/SO5203
Manganese	5500		21	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	21	"	"	"	"	6010p/SO5203
Nickel	2-		21	"	"	"	"	6010p/SO5203
Potassium	7900		2100	"	"	"	07/11/06	6010p/SO5203
Selenium	ND	U	432	"	"	"	07/10/06	6010p/SO5203
Silver	535	A.01, J	432	"	"	"	"	6010p/SO5203
Sodium	-500		210	"	"	"	07/10/06	6010p/SO5203



United States Environmental Protection Agency Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NualiPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
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Lab ID: 060605-.14

Solid - Samzled: 06/J7/06 11:00

Sample ID: MY2JR7

Metals bf E5A 6000/7000 Series Methods

Thallium	ND	U	21	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Vanadium	11		-38	"	"	"	07/10/06	6010p/SO5203
Zinc	910		17	"	"	"	"	6010p/SO5203
% Solids	4-		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.15

Solid - Samzled: 06/J7/06 16:J8

Sample ID: MY2JS6

Metals bf E5A 6000/7000 Series Methods

Mercury	03021	C1, J	03086	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	85000		290	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	29	"	"	"	07/11/06	6010p/SO5203
Arsenic	-3-		239	"	"	"	07/10/06	6010p/SO5203
Barium	12000		14	"	"	"	07/10/06	6010p/SO5203
Beryllium	-5		0329	"	"	"	07/10/06	6010p/SO5203
Boron	78		29	"	"	"	07/10/06	6010p/SO5203
Cadmium	239		134	"	"	"	"	6010p/SO5203
Calcium	-100		290	"	"	"	"	6010p/SO5203
Chromium	70		239	"	"	"	"	6010p/SO5203
Cobalt	ND	U	537	"	"	"	"	6010p/SO5203
Copper	890		11	"	"	"	07/11/06	6010p/SO5203
Iron	5600		290	"	"	"	07/10/06	6010p/SO5203
Lead	120		438	"	"	"	07/11/06	6010p/SO5203
Magnesium	240000	J, A.01	140	"	"	"	07/10/06	6010p/SO5203
Manganese	11000		14	"	"	"	"	6010p/SO5203
Molybdenum	737	C1, J	14	"	"	"	"	6010p/SO5203
Nickel	8-		14	"	"	"	"	6010p/SO5203
Potassium	1500		1400	"	"	"	07/11/06	6010p/SO5203
Selenium	ND	U	239	"	"	"	07/10/06	6010p/SO5203
Silver	11	A.01, J	239	"	"	"	"	6010p/SO5203
Sodium	-50		140	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	14	"	"	"	07/10/06	6010p/SO5203
Vanadium	1-		537	"	"	"	07/10/06	6010p/SO5203
Zinc	1000		11	"	"	"	"	6010p/SO5203
% Solids	70		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.16

Solid - Samzled: 06/J8/06 10:J8

Sample ID: MY2JS7

Metals bf E5A 6000/7000 Series Methods

Mercury	ND	U	03081	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	210000		250	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	25	"	"	"	07/11/06	6010p/SO5203
Arsenic	73-		235	"	"	"	07/10/06	6010p/SO5203
Barium	970		12	"	"	"	07/10/06	6010p/SO5203
Beryllium	738		0325	"	"	"	07/10/06	6010p/SO5203
Boron	220		25	"	"	"	07/10/06	6010p/SO5203
Cadmium	836		132	"	"	"	"	6010p/SO5203



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Project Manager: Matthew Mitguard
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Project: Halaco Integrated Assessment

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75 Hawthorne Street
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SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NuallPiers / Comments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.16 Solid - Samzled: 06/J8/06 10:J8								
Sample ID: MY2JS7 Metals bf E5A 6000/7000 Series Methods								
Calcium	8-00		250	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Chromium	880		235	"	"	"	"	6010p/SO5203
Cobalt	84		439	"	"	"	"	6010p/SO5203
Copper	2800		939	"	"	"	07/11/06	6010p/SO5203
Iron	7900		250	"	"	"	07/10/06	6010p/SO5203
Lead	190		837	"	"	"	07/11/06	6010p/SO5203
Magnesium	87000	J, A.01	120	"	"	"	07/10/06	6010p/SO5203
Manganese	1-00		12	"	"	"	"	6010p/SO5203
Molybdenum	12		12	"	"	"	"	6010p/SO5203
Nickel	190		12	"	"	"	"	6010p/SO5203
Potassium	8900		1200	"	"	"	07/11/06	6010p/SO5203
Selenium	ND	U	235	"	"	"	07/10/06	6010p/SO5203
Silver	831	A.01, J	235	"	"	"	"	6010p/SO5203
Sodium	8-00		120	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	12	"	"	"	07/10/06	6010p/SO5203
Vanadium	-0		439	"	"	"	07/10/06	6010p/SO5203
Zinc	1500		939	"	"	"	"	6010p/SO5203
% Solids	-1		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.17 Solid - Samzled: 06/J8/06 09:0K								
Sample ID: MY2JS- Metals bf E5A 6000/7000 Series Methods								
Mercury	03052		03042	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	57000		880	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	88	"	"	"	07/11/06	6010p/SO5203
Arsenic	ND	U	838	"	"	"	07/10/06	6010p/SO5203
Barium	4600		17	"	"	"	07/10/06	6010p/SO5203
Beryllium	170		0388	"	"	"	"	6010p/SO5203
Boron	100		88	"	"	"	"	6010p/SO5203
Cadmium	438		137	"	"	"	"	6010p/SO5203
Calcium	6600		880	"	"	"	"	6010p/SO5203
Chromium	99		838	"	"	"	"	6010p/SO5203
Cobalt	ND	U	637	"	"	"	"	6010p/SO5203
Copper	-50		18	"	"	"	07/11/06	6010p/SO5203
Iron	4200		880	"	"	"	07/10/06	6010p/SO5203
Lead	90		530	"	"	"	07/11/06	6010p/SO5203
Magnesium	190000	J, A.01	170	"	"	"	07/10/06	6010p/SO5203
Manganese	12000		17	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	17	"	"	"	"	6010p/SO5203
Nickel	40		17	"	"	"	"	6010p/SO5203
Potassium	5600		1700	"	"	"	07/11/06	6010p/SO5203
Selenium	ND	U	838	"	"	"	07/10/06	6010p/SO5203
Silver	538	A.01, J	838	"	"	"	"	6010p/SO5203
Sodium	2600		170	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	17	"	"	"	07/10/06	6010p/SO5203
Vanadium	1-		637	"	"	"	07/10/06	6010p/SO5203



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analte	Result	NualiPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.17 Solid - Samzled: 06/J8/06 09:0K								
Sample ID: MY2JS- Metals bf E5A 6000/7000 Series Methods								
Zinc	1200		18	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
% Solids	60		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.1- Solid - Samzled: 06/J7/06 12:J3								
Sample ID: MY2JS9 Metals bf E5A 6000/7000 Series Methods								
Mercury	03068		03048	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	74000		840	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	84	"	"	"	07/11/06	6010p/SO5203
Arsenic	736		834	"	"	"	07/10/06	6010p/SO5203
Barium	12000		17	"	"	"	07/10/06	6010p/SO5203
Beryllium	54		0384	"	"	"	07/10/06	6010p/SO5203
Boron	150		84	"	"	"	07/10/06	6010p/SO5203
Cadmium	439		137	"	"	"	07/10/06	6010p/SO5203
Calcium	17000		840	"	"	"	07/10/06	6010p/SO5203
Chromium	180		834	"	"	"	07/10/06	6010p/SO5203
Cobalt	ND	U	639	"	"	"	"	6010p/SO5203
Copper	-40		14	"	"	"	07/11/06	6010p/SO5203
Iron	4600		840	"	"	"	07/10/06	6010p/SO5203
Lead	160		532	"	"	"	07/11/06	6010p/SO5203
Magnesium	140000	J, A.01	170	"	"	"	07/10/06	6010p/SO5203
Manganese	4100		17	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	17	"	"	"	07/10/06	6010p/SO5203
Nickel	47		17	"	"	"	"	6010p/SO5203
Potassium	6700		1700	"	"	"	07/11/06	6010p/SO5203
Selenium	13-	C1, J	834	"	"	"	07/10/06	6010p/SO5203
Silver	-30	A.01, J	834	"	"	"	07/10/06	6010p/SO5203
Sodium	8700		170	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	17	"	"	"	07/10/06	6010p/SO5203
Vanadium	84		639	"	"	"	07/10/06	6010p/SO5203
Zinc	940		14	"	"	"	"	6010p/SO5203
% Solids	5-		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.19 Solid - Samzled: 06/J7/06 1K:12								
Sample ID: MY2JT0 Metals bf E5A 6000/7000 Series Methods								
Mercury	ND	U	03051	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	79000		410	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	41	"	"	"	07/11/06	6010p/SO5203
Arsenic	12		431	"	"	"	07/10/06	6010p/SO5203
Barium	18000		20	"	"	"	07/10/06	6010p/SO5203
Beryllium	72		0341	"	"	"	07/10/06	6010p/SO5203
Boron	140		41	"	"	"	07/10/06	6010p/SO5203
Cadmium	832		230	"	"	"	07/10/06	6010p/SO5203
Calcium	2500		410	"	"	"	07/10/06	6010p/SO5203
Chromium	140		431	"	"	"	07/10/06	6010p/SO5203



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Sample Results

Analite	Result	NuallPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
Lab ID: 060605-.19 Solid - Samzled: 06/J7/06 1K:12								
Sample ID: MY2JT0 Metals bf E5A 6000/7000 Series Methods								
Cobalt	ND	U	-32	mg/kg drf	p6G0016	07/06/06	07/10/06	6010p/SO5203
Copper	670		16	"	"	"	07/11/06	6010p/SO5203
Iron	5000		410	"	"	"	07/10/06	6010p/SO5203
Lead	140		631	"	"	"	07/11/06	6010p/SO5203
Magnesium	180000	J, A.01	200	"	"	"	07/10/06	6010p/SO5203
Manganese	4100		20	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	20	"	"	"	07/10/06	6010p/SO5203
Nickel	87		20	"	"	"	"	6010p/SO5203
Potassium	7500		2000	"	"	"	07/11/06	6010p/SO5203
Selenium	ND	U	431	"	"	"	07/10/06	6010p/SO5203
Silver	532	A.01, J	431	"	"	"	07/10/06	6010p/SO5203
Sodium	10000		200	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	20	"	"	"	07/10/06	6010p/SO5203
Vanadium	40		-32	"	"	"	07/10/06	6010p/SO5203
Zinc	1000		16	"	"	"	"	6010p/SO5203
% Solids	49		0	%	p6G0036	07/10/06	07/11/06	% calculation

Lab ID: 060605-.20 Solid - Samzled: 06/J7/06 13:09								
Sample ID: MY2JT1 Metals bf E5A 6000/7000 Series Methods								
Mercury	030-9		03052	mg/kg drf	p6G00J9	07/09/06	07/09/06	7K73/SO5232
Aluminum	44000		420	"	p6G0016	07/06/06	07/10/06	6010p/SO5203
Antimony	ND	U	42	"	"	"	07/11/06	6010p/SO5203
Arsenic	ND	U	432	"	"	"	07/10/06	6010p/SO5203
Barium	14000		21	"	"	"	07/10/06	6010p/SO5203
Beryllium	150		0342	"	"	"	07/10/06	6010p/SO5203
Boron	91		42	"	"	"	"	6010p/SO5203
Cadmium	532		231	"	"	"	"	6010p/SO5203
Calcium	2-00		420	"	"	"	07/10/06	6010p/SO5203
Chromium	70		432	"	"	"	07/10/06	6010p/SO5203
Cobalt	ND	U	-38	"	"	"	"	6010p/SO5203
Copper	550		17	"	"	"	07/11/06	6010p/SO5203
Iron	8100		420	"	"	"	07/10/06	6010p/SO5203
Lead	-8		632	"	"	"	07/11/06	6010p/SO5203
Magnesium	210000	J, A.01	210	"	"	"	07/10/06	6010p/SO5203
Manganese	5900		21	"	"	"	"	6010p/SO5203
Molybdenum	ND	U	21	"	"	"	07/10/06	6010p/SO5203
Nickel	81		21	"	"	"	"	6010p/SO5203
Potassium	7700		2100	"	"	"	07/11/06	6010p/SO5203
Selenium	ND	U	432	"	"	"	07/10/06	6010p/SO5203
Silver	83-	C1, A.01, J	432	"	"	"	07/10/06	6010p/SO5203
Sodium	-400		210	"	"	"	07/10/06	6010p/SO5203
Thallium	ND	U	21	"	"	"	07/10/06	6010p/SO5203
Vanadium	12		-38	"	"	"	07/10/06	6010p/SO5203
Zinc	690		17	"	"	"	07/10/06	6010p/SO5203
% Solids	4-		0	%	p6G0036	07/10/06	07/11/06	% calculation



United States Environmental Protection Agency

Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard	States, Tribes and Site Assessment Office	SDG: 06181C
Project Number: R06S73	75 Hawthorne Street	Reported: 07/19/06 10:21
Project: Halaco Integrated Assessment	San Francisco CA, 94105	

Sample Results

Analfte	Result	NualiPiers / Qomments	Nuantitation Uimit	Bnits	patch	5rezared	Analfyed	Method
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United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

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Project Number: R06S73
Project: Halaco Integrated Assessment

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75 Hawthorne Street
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Reported: 07/19/06 10:21

P2M

Kuality Control

Analfte	Result	NualiPiers / Qomments	Nuantitation Uimit	Bnits	Szike Uevel	Source Result	%REQ	%REQ Uimits	R5C	R5C Uimit
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5rezared: 07/06/06 Analfyed: 07/10/06

Metals bf E5A 6000/7000 Series Methods - Nualitf Qontrol

Batch B6G0016 . 8050B Sld Acid Dig .

Metals, ICP

Blank QB6G0016.BL(1)

Aluminum	DC	B	J00	mg/kg wet
Antimonf	DC	B	J0	"
Arsenic	DC	B	J.0	"
parium	DC	B	10	"
perflium	DC	B	0.J0	"
poron	DC	B	J0	"
Qadmium	DC	B	1.0	"
Qalcium	DC	B	J00	"
Qhromium	DC	B	J.0	"
Qobalt	DC	B	K.0	"
Qozzer	DC	B	8.0	"
Iron	DC	B	J00	"
Uead	DC	B	3.0	"
Magnesium	DC	B	100	"
Manganese	DC	B	10	"
Molfbdenum	DC	B	10	"
Dickel	DC	B	10	"
Sotassium	DC	B	1000	"
Selenium	DC	B	J.0	"
Silver	DC	B	J.0	"
Sodium	DC	B	100	"
Lhallium	DC	B	10	"
Tanadium	DC	B	K.0	"
Vinc	DC	B	8.0	"

Blank QB6G0016.BL(2)

Aluminum	DC	B	J00	mg/kg wet
Antimonf	DC	B	J0	"
Arsenic	DC	B	J.0	"
parium	DC	B	10	"
perflium	DC	B	0.J0	"
poron	DC	B	J0	"
Qadmium	DC	B	1.0	"
Qalcium	DC	B	J00	"
Qhromium	DC	B	J.0	"
Qobalt	DC	B	K.0	"
Qozzer	DC	B	8.0	"
Iron	DC	B	J00	"
Uead	DC	B	3.0	"
Magnesium	DC	B	100	"
Manganese	DC	B	10	"
Molfbdenum	DC	B	10	"
Dickel	DC	B	10	"
Sotassium	DC	B	1000	"
Selenium	DC	B	J.0	"



United States Environmental Protection Agency Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Quality Control

Analite	Result	NualiPiers / Comments	Nuantitation Uimit	Bnits	Szike Uevel	Source Result	%REQ	%REQ Uimits	R5C	R5C Uimit
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5reared: 07/06/06 Analfyed: 07/10/06

Metals bf E5A 6000/7000 Series Methods - Nualitf Qontrol

Batch B6G0016 . 8050B Sld Acid Dig .

Metals, ICP

Blank QB6G0016.BL(2)

Silver	DC	B	J.0	"
Sodium	DC	B	100	"
Lhallium	DC	B	10	"
Tanadium	DC	B	K.0	"
Vinc	DC	B	8.0	"

Matrix Spike QB6G0016.MS1)

Source: 060605-.12

Aluminum	JKJ00	N10	JK0	mg/kg drf	K29	J2700	DR	72-1J2	J0
Antimonf	9K.7		JK	"	112	DC	8J	72-1J2	J0
Arsenic	368		J.K	"	K29	DC	80	72-1J2	J0
parium	686		1J	"	K29	31K	81	72-1J2	J0
perflium	82.7	N10	0.JK	"	11.2	70.3	13K	72-1J2	J0
poron	372		JK	"	K29	17.7	78	72-1J2	J0
Qadmium	9.13		1.J	"	11.2	DC	79	72-1J2	J0
Qalcium	67J0	NK	JK0	"	JJ90	2K00	28	72-1J2	J0
Qhromium	22.2		J.K	"	K2.9	19.3	79	72-1J2	J0
Qobalt	82.8		K.8	"	112	DC	72	72-1J2	J0
Qozzer	166	NK	9.6	"	27.K	133	27	72-1J2	J0
Iron	2J30	N10	JK0	"	JJ9	2710	DR	72-1J2	J0
Uead	10J		3.6	"	112	8.12	8J	72-1J2	J0
Magnesium	186000	N10	1J0	"	JJ90	19J000	DR	72-1J2	J0
Manganese	K730		1J	"	112	K6J0	96	72-1J2	J0
Molfbdenum	91.7		1J	"	112	DC	81	72-1J2	J0
Dickel	99.J		1J	"	112	1J.8	72	72-1J2	J0
Sotassium	33300	N10	K800	"	JJ90	31600	7K	72-1J2	J0
Selenium	326		J.K	"	K29	DC	78	72-1J2	J0
Silver	12.6		J.K	"	11.2	2.K0	89	72-1J2	J0
Sodium	7190	NK	1J0	"	JJ90	2270	71	72-1J2	J0
Lhallium	3JK	NK	1J	"	K29	DC	71	72-1J2	J0
Tanadium	98.J		K.8	"	112	2.K8	81	72-1J2	J0
Vinc	6J3	N10	9.6	"	112	220	63	72-1J2	J0

Matrix Spike Dup QB6G0016.MSD1)

Source: 060605-.12

Aluminum	JK600	N10	JK0	mg/kg drf	K7J	J2700	DR	72-1J2	J	J0
Antimonf	10J		JK	"	118	DC	86	72-1J2	7	J0
Arsenic	390		J.K	"	K7J	DC	83	72-1J2	6	J0
parium	7J2		1J	"	K7J	31K	87	72-1J2	6	J0
perflium	89.8	N10	0.JK	"	11.8	70.3	162	72-1J2	2	J0
poron	K00		JK	"	K7J	17.7	81	72-1J2	6	J0
Qadmium	9.88		1.J	"	11.8	DC	8K	72-1J2	8	J0
Qalcium	6790	NK	JK0	"	J360	2K00	29	72-1J2	1	J0
Qhromium	6J.K		J.K	"	K7.J	19.3	91	72-1J2	1J	J0
Qobalt	87.9	NK	K.8	"	118	DC	7K	72-1J2	J	J0
Qozzer	18K		9.6	"	29.1	133	86	72-1J2	10	J0
Iron	K200	N10	JK0	"	J36	2710	DR	72-1J2	12	J0
Uead	109		3.6	"	118	8.12	82	72-1J2	7	J0
Magnesium	193000	N10	1J0	"	J360	19J000	KJ	72-1J2	K	J0



United States Environmental Protection Agency Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Quality Control

Analite	Result	NualiPiers / Qomments	Nuantitation Uimit	Bnits	Szike Uevel	Source Result	%REQ	%REQ Uimits	R5C	R5C Uimit
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5rezared: 07/06/06 Analified: 07/10/06

Metals bf E5A 6000/7000 Series Methods - Nualitf Qontrol

Batch B6G0016 . 8050B Sld Acid Dig .

Metals, ICP

Matrix Spike Dup QB6G0016.MSD1)

Source: 060605-.12

Manganese	K670	N10	1J	"	118	K6J0	KJ	72-1J2	1	J0
Molfbdenum	103		1J	"	118	DC	87	72-1J2	11	J0
Dickel	103		1J	"	118	1J.8	76	72-1J2	K	J0
Sotassium	32700	N10	K800	"	J360	31600	17K	72-1J2	7	J0
Selenium	376		J.K	"	K7J	DC	80	72-1J2	2	J0
Silver	16.7		J.K	"	11.8	2.K0	96	72-1J2	7	J0
Sodium	7320		1J0	"	J360	2270	72	72-1J2	J	J0
Lhallium	3K3	NK	1J	"	K7J	DC	73	72-1J2	6	J0
Tanadium	102		K.8	"	118	2.K8	8K	72-1J2	7	J0
Vinc	621		9.6	"	118	220	86	72-1J2	K	J0

Reference QB6G0016.SRM1)

Aluminum	3J3		J00	mg/kg wet	309		102	6J.K9-137
Antimonf	JK0		J0	"	J13		113	60.72-1K0
Arsenic	1060		J.0	"	930		11K	62.98-13K
parium	2.J6	Q1Z 4	10	"	2.30		99	K7.17-123
perflium	19.6		0.J0	"	18.8		10K	81.38-118
Qadmium	K1.K		1.0	"	K1.6		100	77.16-1J3
Qalcium	172000		J00	"	18K000		92	77.68-1JJ
Qhromium	10K		J.0	"	96.2		108	80.06-119
Qobalt	136		K.0	"	1K0		97	8J.KJ-118
Qozzer	6110		8.0	"	6680		91	82.73-11K
Iron	J3000		J00	"	J1000		110	80.1K-1J0
Uead	J1J		3.0	"	JJK		92	7K.8J-1J2
Magnesium	99J00		100	"	113000		88	86.J8-11K
Manganese	J0K		10	"	J01		101	83.23-117
Dickel	27.1		10	"	26.8		101	76.28-1J3
Sotassium	DC	B	1000	"	10J			0-370
Selenium	K3.2		J.0	"	37.0		118	K7.27-12J
Silver	J9.8	A-01	J.0	"	J0.9		1K3	63.16-136
Sodium	DC	B	100	"	9J.8			0-J99
Lhallium	37.0		10	"	38.1		97	6K.27-132
Tanadium	70.8		K.0	"	62.8		108	80.22-119
Vinc	172		8.0	"	172		100	7J.97-1J7

Reference QB6G0016.SRM2)

Aluminum	3JJ		J00	mg/kg wet	309		10K	6J.K9-137
Antimonf	J3K		J0	"	J13		110	60.72-1K0
Arsenic	1020		J.0	"	930		113	62.98-13K
parium	2.1K	Q1Z 4	10	"	2.30		97	K7.17-123
perflium	18.9		0.J0	"	18.8		101	81.38-118
Qadmium	K0.K		1.0	"	K1.6		97	77.16-1J3
Qalcium	169000		J00	"	18K000		9J	77.68-1JJ
Qhromium	103		J.0	"	96.2		107	80.06-119
Qobalt	132		K.0	"	1K0		96	8J.KJ-118
Qozzer	2880		8.0	"	6680		88	82.73-11K
Iron	JJ700		J00	"	J1000		108	80.1K-1J0



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 06181C
Reported: 07/19/06 10:21

Quality Control

Analite	Result	NuallPiers / Comments	Nuantitation Uimit	Bnits	Szike Uevel	Source Result	%REQ	%REQ Uimits	R5C	R5C Uimit
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5rezared: 07/06/06 Analfyed: 07/10/06

Batch B6G0016 . 8050B Sld Acid Dig .

Metals bf E5A 6000/7000 Series Methods - Nualitf Qontrol

Metals, ICP

Reference QB6G0016.SRM2)

Uead	J10		3.0	"	JJK		9K	7K.8J-1J2		
Magnesium	92800	A-01	100	"	113000		82	86.J8-11K		
Manganese	198		10	"	J01		99	83.23-117		
Dickel	26.9		10	"	26.8		100	76.28-1J3		
Sotassium	DC	B	1000	"	10J			0-370		
Selenium	KJ.2		J.0	"	37.0		112	K7.27-12J		
Silver	38.7	A-01	J.0	"	J0.9		182	63.16-136		
Sodium	DC	B	100	"	9J.8			0-J99		
Lhallium	32.9		10	"	38.1		9K	6K.27-132		
Tanadium	69.0		K.0	"	62.8		102	80.22-119		
Vinc	17J		8.0	"	172		98	7J.97-1J7		

5rezared , Analfyed: 07/09/06

Batch B6G0029 . 7478 Hg Prep .

Metals bf E5A 6000/7000 Series Methods - Nualitf Qontrol

Mercury

Blank QB6G0029.BL(1)

Mercurf	DC	B	0.0J2	mg/kg wet						
Matrix Spike QB6G0029.MS1)	Source: 060605-.12									
Mercurf	0.169		0.030	mg/kg drf	0.160	DC	106	80-1J0		J0
Matrix Spike Dup QB6G0029.MSD1)	Source: 060605-.12									
Mercurf	0.171		0.030	mg/kg drf	0.12K	DC	111	80-1J0	2	J0
Reference QB6G0029.SRM1)										
Mercurf	0.KJ1		0.0J2	mg/kg wet	0.KK7		9K	80-1J0		

5rezared: 07/10/06 Analfyed: 07/11/06

Batch B6G0086 . Solids, Dry Weight

Qonventional Qhemistrf Sarameters bf A5HA/E5A Methods - Nualitf Qontrol

QPrep) . Solids, Dry Weight

Blank QB6G0086.BL(1)

% Solids	DC	B	0	%						
Duplicate QB6G0086.DUP1)	Source: 060605-.20									
% Solids	K6		0	%		K8			K	J0



United States Environmental Protection Agency
Region 9 Laboratory

9CC1 Dj)63c D3dhh3k OsyueymR 409k Pyacofmek SA 2)70)
Ecfmh:B590()94-4C00 Ftx:B590()94-4C04

Project Manager: Matthew Mitguard

Project Number: R06S73

Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office

75 Hawthorne Street

San Francisco CA, 94105

SDG: 06181C

Reported: 07/19/06 10:21

Kualifiers and Comments

NK Lhe matri& szike and/or matri& szike duzlicate associated with this samzle did not meet recoverf criteria Por this analfte xsee MS/MSC results Por this batch in NQ summarf(

N10 Lhe analfte concentration in the unPortiPied samzle is signiPicantlf greater than the concentration sziked into the matri& szike and matri& szike duzlicate. Lhe rezorted szike recoverf is not a meaningPul measure oP the dataset)s analftical accuracf.

4 Lhe rezorted result Por this analfte should be considered an estimated value.

Q1 Lhe rezorted concentration Por this analfte is below the 'uantitation limit.

A-01 Lhe recoverf in the SRM did not meet NQ criteria Por this analfte.

B Dot Cetected

DR Dot Rezorted



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Subject: Analytical Testing Results - Project R06S73
SDG: 06181E

From: Brenda Bettencourt, Director
EPA Region 9 Laboratory
MTS-2

To: Matthew Mitguard
States, Tribes and Site Assessment Office
SFD-9-1

A223tach 3ec 2ac ecdrs2d uelf 2ac 3o3smdnd lu d3fyscd uelf 2ac **Malaco Integrated**

Assessment yelict2p jacdc h323 a3.c Tcco ec.ncvch no 3ttleh3otc vn2a bwA EcPnlo 7
L3Tle32lem ylsntmp

A urss hltrfco232nlo y3tR3Pc ule 2acdc h323g notsrhnoP e3v h323 3oh d3fysc trd2lhm
hltrfco232nlog nd lo unsc 32 2ac bwA EcPnlo 7 L3Tle32lemp lu mlr vlrsh snRc 2l eckrcd2
3hhn2nlo3s ec.ncv 3oh,le .3snh32nlo lu 2ac h323g ysc3dc tlo23t2 brPcon3 qtN3rPa2lo 32 2ac
EcPnlo 7 /r3sn2m Addre3otc Muuntcp

lu mlr a3.c 3om krkd2nldog ysc3dc 3dR ule Enta3eh Q3rceg 2ac L3T welict2
q3o3Pce 32 O590B(9)4-00p

Analyses included in this

qcetrem
Slsnhdg Dem WcnPa2

qc23sdg ICw



United States Environmental Protection Agency
Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entaflohg CA 7(80(
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard

Project Number: R06S73

Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office

75 Hawthorne Street

San Francisco CA, 94105

SDG: 061218

Reported: 07/19/06 11:06

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
MCYJ4Y	0606059-01	Solid	06/Y7/06 1Y:30	06/30/06 07:35
MCYJ43	0606059-0Y	Solid	06/Y7/06 09:K5	06/30/06 07:35
MCYJ4K	0606059-03	Solid	06/Y7/06 02:K5	06/30/06 07:35
MCYJ45	0606059-0K	Solid	06/Y3/06 09:30	06/30/06 07:35
MCYJ42	0606059-05	Solid	06/Y6/06 09:K5	06/30/06 07:35
MCYJN3	0606059-06	Solid	06/Y6/06 11:15	06/30/06 07:35
MCYJL1	0606059-07	Solid	06/Y6/06 17:02	06/30/06 07:35

jac d3fyscd vcec a3oh4hcsn.cech 2l 2ac s3Tle32lem 32)0 hcPeccd Ccsdnrdp



United States Environmental Protection Agency Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entaflohg CA 7(80)
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 061218
Reported: 07/19/06 11:06

Sample Results

Analyte	Result	Lualifiers / bomments	Luantitation Qimit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606059-01				Solid - Sampled: 06/Y7/06 1Y:30				
Sample ID: MY2JT2				Metals Ey 8PA 6000/7000 Series Methods				
Mercury	0.047	C1, J	0.052	mg/kg dry	B6G00Y6	07/02/06	07/02/06	7K73/SOP535
Aluminum	38000		420	"	B6G0016	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	42	"	"	"	07/11/06	6010B/SOP503
Arsenic	16		4.2	"	"	"	07/10/06	6010B/SOP503
Barium	15000		21	"	"	"	07/10/06	6010B/SOP503
Beryllium	86		0.42	"	"	"	07/10/06	6010B/SOP503
Boron	200		42	"	"	"	07/11/06	6010B/SOP503
Cadmium	8.5		2.1	"	"	"	"	6010B/SOP503
Calcium	2500		420	"	"	"	"	6010B/SOP503
Chromium	180	k4, J	4.2	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U, k4, J	3.8	"	"	"	"	6010B/SOP503
Copper	620		17	"	"	"	07/11/06	6010B/SOP503
Iron	4700		420	"	"	"	07/10/06	6010B/SOP503
Lead	120		6.2	"	"	"	07/11/06	6010B/SOP503
Magnesium	150000	J, A-01	210	"	"	"	07/10/06	6010B/SOP503
Manganese	4600		21	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	21	"	"	"	07/10/06	6010B/SOP503
NicVel	84		21	"	"	"	"	6010B/SOP503
Potassium	6400		2100	"	"	"	07/11/06	6010B/SOP503
Selenium	ND	U	4.2	"	"	"	07/10/06	6010B/SOP503
Silver	7.7	A-01, J	4.2	"	"	"	07/10/06	6010B/SOP503
Sodium	3000	k4, J	210	"	"	"	07/11/06	6010B/SOP503
Thallium	ND	U	21	"	"	"	07/11/06	6010B/SOP503
Zanadium	89		3.8	"	"	"	07/10/06	6010B/SOP503
%inc	310		17	"	"	"	"	6010B/SOP503
K Solids	43		0	%	B6G0037	07/10/06	07/11/06	% calculation

Lab ID: 0606059-02				Solid - Sampled: 06/Y7/06 09:K5				
Sample ID: MY2JT8				Metals Ey 8PA 6000/7000 Series Methods				
Mercury	0.071		0.049	mg/kg dry	B6G00Y6	07/02/06	07/09/06	7K73/SOP535
Aluminum	120000		890	"	B6G0016	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	89	"	"	"	07/11/06	6010B/SOP503
Arsenic	20		8.9	"	"	"	07/10/06	6010B/SOP503
Barium	7700		20	"	"	"	07/10/06	6010B/SOP503
Beryllium	83		0.89	"	"	"	07/10/06	6010B/SOP503
Boron	230		89	"	"	"	07/11/06	6010B/SOP503
Cadmium	6.7		2.0	"	"	"	07/11/06	6010B/SOP503
Calcium	8300		890	"	"	"	07/11/06	6010B/SOP503
Chromium	130		8.9	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U	7.3	"	"	"	"	6010B/SOP503
Copper	1800		16	"	"	"	07/11/06	6010B/SOP503
Iron	5700		890	"	"	"	07/10/06	6010B/SOP503
Lead	200		5.9	"	"	"	07/11/06	6010B/SOP503
Magnesium	93000	J, A-01	200	"	"	"	07/10/06	6010B/SOP503



United States Environmental Protection Agency Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entafloh CA 7(80)
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 061218
Reported: 07/19/06 11:06

Sample Results

Analyte	Result	Lualifiers / bomments	Luantitation Qimit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606059-02							Solid - Sampled: 06/Y7/06 09:K5	
Sample ID: MY2JT8							Metals Ey 8PA 6000/7000 Series Methods	
Manganese	8400		20	mg/kg dry	B6G0016	07/06/06	07/10/06	6010B/SOP503
Molybdenum	ND	U	20	"	"	"	07/10/06	6010B/SOP503
NicVel	57		20	"	"	"	"	6010B/SOP503
Potassium	6700		2000	"	"	"	07/11/06	6010B/SOP503
Selenium	2.0	C1, J	8.9	"	"	"	07/10/06	6010B/SOP503
Silver	11	A-01, J	8.9	"	"	"	"	6010B/SOP503
Sodium	7300		200	"	"	"	07/11/06	6010B/SOP503
Thallium	ND	U	20	"	"	"	07/11/06	6010B/SOP503
Zanadium	56		7.3	"	"	"	07/10/06	6010B/SOP503
%inc	1400		16	"	"	"	"	6010B/SOP503
K Solids	51		0	%	B6G0037	07/10/06	07/11/06	% calculation

Lab ID: 0606059-08							Solid - Sampled: 06/Y7/06 02:K5	
Sample ID: MY2JT4							Metals Ey 8PA 6000/7000 Series Methods	
Mercury	0.089		0.089	mg/kg dry	B6G00Y6	07/02/06	07/09/06	7K73/SOP535
Aluminum	120000		810	"	B6G0016	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	81	"	"	"	07/11/06	6010B/SOP503
Arsenic	7.3		8.1	"	"	"	07/10/06	6010B/SOP503
Barium	6600		16	"	"	"	07/10/06	6010B/SOP503
Beryllium	50		0.81	"	"	"	07/10/06	6010B/SOP503
Boron	190		81	"	"	"	07/11/06	6010B/SOP503
Cadmium	6.2		1.6	"	"	"	"	6010B/SOP503
Calcium	4800		810	"	"	"	"	6010B/SOP503
Chromium	200		8.1	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U	6.2	"	"	"	"	6010B/SOP503
Copper	1300		12	"	"	"	07/11/06	6010B/SOP503
Iron	6100		810	"	"	"	07/10/06	6010B/SOP503
Lead	200		4.7	"	"	"	07/11/06	6010B/SOP503
Magnesium	110000	J, A-01	160	"	"	"	07/10/06	6010B/SOP503
Manganese	4000		16	"	"	"	"	6010B/SOP503
Molybdenum	3.3	C1, J	16	"	"	"	"	6010B/SOP503
NicVel	95		16	"	"	"	"	6010B/SOP503
Potassium	2300		1600	"	"	"	07/11/06	6010B/SOP503
Selenium	2.1	C1, J	8.1	"	"	"	07/10/06	6010B/SOP503
Silver	6.6	A-01, J	8.1	"	"	"	"	6010B/SOP503
Sodium	2900		160	"	"	"	07/11/06	6010B/SOP503
Thallium	ND	U	16	"	"	"	07/11/06	6010B/SOP503
Zanadium	58		6.2	"	"	"	07/10/06	6010B/SOP503
%inc	1700		12	"	"	"	"	6010B/SOP503
K Solids	64		0	%	B6G0037	07/10/06	07/11/06	% calculation

Lab ID: 0606059-04							Solid - Sampled: 06/Y3/06 09:30	
Sample ID: MY2JT5							Metals Ey 8PA 6000/7000 Series Methods	
Mercury	0.083		0.027	mg/kg dry	B6G00Y6	07/02/06	07/02/06	7K73/SOP535



United States Environmental Protection Agency Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entaflohg CA 7(80)
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 061218
Reported: 07/19/06 11:06

Sample Results

Analyte	Result	Lualifiers / bomments	Luantitation Qimit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606059-04						Solid - Sampled: 06/Y3/06 09:30		
Sample ID: MY2JT5						Metals Ey 8PA 6000/7000 Series Methods		
Aluminum	7600		220	mg/kg dry	B6G0016	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	22	"	"	"	07/11/06	6010B/SOP503
Arsenic	2.7		2.2	"	"	"	07/10/06	6010B/SOP503
Barium	180		11	"	"	"	07/10/06	6010B/SOP503
Beryllium	0.85		0.22	"	"	"	07/10/06	6010B/SOP503
Boron	11	C1, J	22	"	"	"	07/11/06	6010B/SOP503
Cadmium	ND	U	1.1	"	"	"	"	6010B/SOP503
Calcium	12000		220	"	"	"	"	6010B/SOP503
Chromium	15		2.2	"	"	"	07/10/06	6010B/SOP503
Cobalt	4.1	C1, J	4.8	"	"	"	"	6010B/SOP503
Copper	12		3.7	"	"	"	07/11/06	6010B/SOP503
Iron	14000		220	"	"	"	07/10/06	6010B/SOP503
Lead	4.7		8.8	"	"	"	07/11/06	6010B/SOP503
Magnesium	4200	J, A-01	110	"	"	"	07/10/06	6010B/SOP503
Manganese	280		11	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	11	"	"	"	"	6010B/SOP503
NicVel	18		11	"	"	"	"	6010B/SOP503
Potassium	4000		1100	"	"	"	07/11/06	6010B/SOP503
Selenium	ND	U	2.2	"	"	"	07/10/06	6010B/SOP503
Silver	ND	U	2.2	"	"	"	"	6010B/SOP503
Sodium	2300		110	"	"	"	07/11/06	6010B/SOP503
Thallium	ND	U	11	"	"	"	07/11/06	6010B/SOP503
Zanadium	27		4.8	"	"	"	07/10/06	6010B/SOP503
%inc	85		3.7	"	"	"	"	6010B/SOP503
K Solids	92		0	%	B6G0037	07/10/06	07/11/06	% calculation

Lab ID: 0606059-05						Solid - Sampled: 06/Y6/06 09:K5		
Sample ID: MY2JT3						Metals Ey 8PA 6000/7000 Series Methods		
Mercury	0.021	C1, J	0.080	mg/kg dry	B6G00Y6	07/02/06	07/02/06	7K73/SOP535
Aluminum	130000		240	"	B6G0016	07/06/06	07/10/06	6010B/SOP503
Antimony	19	C1, J	24	"	"	"	07/11/06	6010B/SOP503
Arsenic	4.2		2.4	"	"	"	07/10/06	6010B/SOP503
Barium	990		12	"	"	"	07/10/06	6010B/SOP503
Beryllium	12		0.24	"	"	"	07/10/06	6010B/SOP503
Boron	94		24	"	"	"	07/11/06	6010B/SOP503
Cadmium	80		1.2	"	"	"	"	6010B/SOP503
Calcium	15000		240	"	"	"	"	6010B/SOP503
Chromium	330		2.4	"	"	"	07/10/06	6010B/SOP503
Cobalt	9.1		4.3	"	"	"	"	6010B/SOP503
Copper	14000		89	"	"	"	07/1Y/06	6010B/SOP503
Iron	23000		240	"	"	"	07/10/06	6010B/SOP503
Lead	1000		8.6	"	"	"	07/11/06	6010B/SOP503
Magnesium	47000	J, A-01	120	"	"	"	07/10/06	6010B/SOP503
Manganese	4500		12	"	"	"	"	6010B/SOP503



United States Environmental Protection Agency Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entafloh CA 7(80)
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 061218
Reported: 07/19/06 11:06

Sample Results

Analyte	Result	Lualifiers / bomments	Luanitation Qimit	Units	Batch	Prepared	Analyzed	Method
Lab ID:	0606059-05						Solid - Sampled: 06/Y6/06 09:K5	
Sample ID:	MY2JT3						Metals Ey 8PA 6000/7000 Series Methods	
Molybdenum	93		12	mg/kg dry	B6G0016	07/06/06	07/10/06	6010B/SOP503
NicVel	490		12	"	"	"	"	6010B/SOP503
Potassium	21000		1200	"	"	"	07/11/06	6010B/SOP503
Selenium	14		2.4	"	"	"	07/10/06	6010B/SOP503
Silver	23	A-01, J	2.4	"	"	"	"	6010B/SOP503
Sodium	11000		120	"	"	"	07/11/06	6010B/SOP503
Thallium	ND	U	12	"	"	"	07/11/06	6010B/SOP503
Zanadium	74		4.3	"	"	"	07/10/06	6010B/SOP503
%inc	6800		89	"	"	"	07/1Y/06	6010B/SOP503
K Solids	38		0	%	B6G0037	07/10/06	07/11/06	% calculation

Lab ID:	0606059-06						Solid - Sampled: 06/Y6/06 11:15	
Sample ID:	MY2JQ8						Metals Ey 8PA 6000/7000 Series Methods	
Mercury	0.029	C1	0.029	mg/kg dry	B6G00Y6	07/02/06	07/02/06	7K73/SOP535
Aluminum	25000		240	"	B6G0016	07/06/06	07/10/06	6010B/SOP503
Antimony	ND	U	24	"	"	"	07/11/06	6010B/SOP503
Arsenic	2.0	C1, J	2.4	"	"	"	07/10/06	6010B/SOP503
Barium	950		12	"	"	"	07/10/06	6010B/SOP503
Beryllium	110		0.24	"	"	"	07/10/06	6010B/SOP503
Boron	29		24	"	"	"	07/11/06	6010B/SOP503
Cadmium	ND	U	1.2	"	"	"	"	6010B/SOP503
Calcium	6700		240	"	"	"	"	6010B/SOP503
Chromium	85		2.4	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U	4.7	"	"	"	"	6010B/SOP503
Copper	90		9.4	"	"	"	07/11/06	6010B/SOP503
Iron	6200		240	"	"	"	07/10/06	6010B/SOP503
Lead	6.3		8.5	"	"	"	07/11/06	6010B/SOP503
Magnesium	240000	J, A-01	470	"	"	"	07/1Y/06	6010B/SOP503
Manganese	7000		12	"	"	"	07/10/06	6010B/SOP503
Molybdenum	ND	U	12	"	"	"	"	6010B/SOP503
NicVel	24		12	"	"	"	"	6010B/SOP503
Potassium	12000		1200	"	"	"	07/11/06	6010B/SOP503
Selenium	ND	U	2.4	"	"	"	07/10/06	6010B/SOP503
Silver	3.9	A-01, J	2.4	"	"	"	"	6010B/SOP503
Sodium	6200		120	"	"	"	07/11/06	6010B/SOP503
Thallium	ND	U	12	"	"	"	07/11/06	6010B/SOP503
Zanadium	11		4.7	"	"	"	07/10/06	6010B/SOP503
%inc	550		9.4	"	"	"	"	6010B/SOP503
K Solids	35		0	%	B6G0037	07/10/06	07/11/06	% calculation

Lab ID:	0606059-07						Solid - Sampled: 06/Y6/06 17:02	
Sample ID:	MY2Jk1						Metals Ey 8PA 6000/7000 Series Methods	
Mercury	0.058	C1, J	0.053	mg/kg dry	B6G00Y6	07/02/06	07/02/06	7K73/SOP535
Aluminum	180000		470	"	B6G0016	07/06/06	07/10/06	6010B/SOP503



United States Environmental Protection Agency
Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entaflohg CA 7(80(
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard

Project Number: R06S73

Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office

75 Hawthorne Street

San Francisco CA, 94105

SDG: 061218

Reported: 07/19/06 11:06

Sample Results

Analyte	Result	Lualifiers / bomments	Luantitation Qimit	Units	Batch	Prepared	Analyzed	Method
Lab ID: 0606059-07						Solid - Sampled: 06/Y6/06 17:02		
Sample ID: MY2Jk1						Metals Ey 8PA 6000/7000 Series Methods		
Antimony	ND	U	47	mg/kg dry	B6G0016	07/06/06	07/11/06	6010B/SOP503
Arsenic	6.7		4.7	"	"	"	07/10/06	6010B/SOP503
Barium	8500		28	"	"	"	07/10/06	6010B/SOP503
Beryllium	24		0.47	"	"	"	07/10/06	6010B/SOP503
Boron	260		47	"	"	"	07/11/06	6010B/SOP503
Cadmium	6.6		2.8	"	"	"	"	6010B/SOP503
Calcium	2600		470	"	"	"	"	6010B/SOP503
Chromium	800		4.7	"	"	"	07/10/06	6010B/SOP503
Cobalt	ND	U	9.8	"	"	"	"	6010B/SOP503
Copper	2000		19	"	"	"	07/11/06	6010B/SOP503
Iron	6200		470	"	"	"	07/10/06	6010B/SOP503
Lead	890		7.0	"	"	"	07/11/06	6010B/SOP503
Magnesium	73000	J, A-01	280	"	"	"	07/10/06	6010B/SOP503
Manganese	1000		28	"	"	"	"	6010B/SOP503
Molybdenum	ND	U	28	"	"	"	"	6010B/SOP503
NicVel	33		28	"	"	"	"	6010B/SOP503
Potassium	2700		2800	"	"	"	07/11/06	6010B/SOP503
Selenium	4.4	C1, J	4.7	"	"	"	07/10/06	6010B/SOP503
Silver	2.3	C1, J, A-01	4.7	"	"	"	"	6010B/SOP503
Sodium	2400		280	"	"	"	07/11/06	6010B/SOP503
Thallium	ND	U	28	"	"	"	07/11/06	6010B/SOP503
Zanadium	68		9.8	"	"	"	07/10/06	6010B/SOP503
%inc	1800		19	"	"	"	"	6010B/SOP503
K Solids	48		0	%	B6G0037	07/10/06	07/11/06	% calculation



United States Environmental Protection Agency Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entafloh CA 7(80)
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 061218
Reported: 07/19/06 11:06

E7/

Quality Control

Analyte	Result	Lualifiers / bomments	Luantitation Qimit	Units	Spike Qevel	Source Result	%R8b	%R8b Qimits	RPD	RPD Qimit
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Prepared: 07/06/06 Analyzed: 07/10/06

Metals Ey 8PA 6000/7000 Series Methods - Luality control

Batch B6G0016 - 8050B Sld Acid Dig -

Metals, ICP

BlanV (B6G0016-BL)1W

Aluminum	.D	U	Y00	mg/kg wet
Antimony	.D	U	Y0	"
Arsenic	.D	U	YT0	"
Barium	.D	U	10	"
Beryllium	.D	U	0TY0	"
Boron	.D	U	Y0	"
badmium	.D	U	1T0	"
balcium	.D	U	Y00	"
bhromium	.D	U	YT0	"
boEalt	.D	U	KT0	"
bopper	.D	U	2T0	"
Iron	.D	U	Y00	"
Qead	.D	U	3T0	"
Magnesium	.D	U	100	"
Manganese	.D	U	10	"
MolyEdenum	.D	U	10	"
.ickel	.D	U	10	"
Potassium	.D	U	1000	"
Selenium	.D	U	YT0	"
Silver	.D	U	YT0	"
Sodium	.D	U	100	"
4hallium	.D	U	10	"
Vanadium	.D	U	KT0	"
Zinc	.D	U	2T0	"

BlanV (B6G0016-BL)2W

Aluminum	.D	U	Y00	mg/kg wet
Antimony	.D	U	Y0	"
Arsenic	.D	U	YT0	"
Barium	.D	U	10	"
Beryllium	.D	U	0TY0	"
Boron	.D	U	Y0	"
badmium	.D	U	1T0	"
balcium	.D	U	Y00	"
bhromium	.D	U	YT0	"
boEalt	.D	U	KT0	"
bopper	.D	U	2T0	"
Iron	.D	U	Y00	"
Qead	.D	U	3T0	"
Magnesium	.D	U	100	"
Manganese	.D	U	10	"
MolyEdenum	.D	U	10	"
.ickel	.D	U	10	"
Potassium	.D	U	1000	"
Selenium	.D	U	YT0	"



United States Environmental Protection Agency Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entaflohg CA 7(80)
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 061218
Reported: 07/19/06 11:06

Quality Control

Analyte	Result	Lualifiers / bomments	Luantitation Qimit	Units	Spike Qevel	Source Result	%R8b	%R8b Qimits	RPD	RPD Qimit
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Prepared: 07/06/06 Analyzed: 07/10/06

Metals Ey 8PA 6000/7000 Series Methods - Luality control

Batch B6G0016 - 8050B Sld Acid Dig -

Metals, ICP

BlanV (B6G0016-BL)2W

Silver	.D	U	YT0	"
Sodium	.D	U	100	"
4hallium	.D	U	10	"
Vanadium	.D	U	KT0	"
Zinc	.D	U	2T0	"

Matrix SpiVe (B6G0016-MS2W

Source: 0606059-01

Aluminum	75100	L10	KY0	mg/kg dry	217	2Y200	.R	75-1Y5		Y0
Antimony	172		KY	"	Y0K	.D	27	75-1Y5		Y0
Arsenic	67Y		KTY	"	217	15T6	20	75-1Y5		Y0
Barium	16100		Y1	"	217	15Y00	110	75-1Y5		Y0
Beryllium	57T7		0TKY	"	Y0TK	36TK	10K	75-1Y5		Y0
Boron	297		KY	"	217	Y0K	25	75-1Y5		Y0
badmium	Y0TK		YT1	"	Y0TK	3TK9	23	75-1Y5		Y0
balcium	5210		KY0	"	K020	YK60	2Y	75-1Y5		Y0
bhromium	19Y	LK	KTY	"	21T7	133	7Y	75-1Y5		Y0
boEalt	135	LK	2T3	"	Y0K	.D	66	75-1Y5		Y0
bopper	71Y		17	"	10Y	6Y1	29	75-1Y5		Y0
Iron	K220	L10	KY0	"	K02	K660	5K	75-1Y5		Y0
Qead	Y91		6TY	"	Y0K	1YK	2Y	75-1Y5		Y0
Magnesium	1K0000	L10	Y10	"	K020	1K7000	.R	75-1Y5		Y0
Manganese	K560	L10	Y1	"	Y0K	K610	.R	75-1Y5		Y0
MolyEdenum	166		Y1	"	Y0K	.D	21	75-1Y5		Y0
.ickel	127		Y1	"	Y0K	33T2	75	75-1Y5		Y0
Potassium	10300		Y100	"	K020	6390	96	75-1Y5		Y0
Selenium	6YK		KTY	"	217	.D	76	75-1Y5		Y0
Silver	Y6T1		KTY	"	Y0TK	7T7K	90	75-1Y5		Y0
Sodium	11200		Y10	"	K020	7950	9K	75-1Y5		Y0
4hallium	672		Y1	"	217	.D	23	75-1Y5		Y0
Vanadium	Y05		2T3	"	Y0K	32T9	21	75-1Y5		Y0
Zinc	1050		17	"	Y0K	209	112	75-1Y5		Y0

Matrix SpiVe Dup (B6G0016-MSD2W

Source: 0606059-01

Aluminum	21K00	L10	KY0	mg/kg dry	209	2Y200	.R	75-1Y5	2	Y0
Antimony	17Y		KY	"	Y0Y	.D	25	75-1Y5	3	Y0
Arsenic	66K		KTY	"	209	15T6	20	75-1Y5	1	Y0
Barium	15300	L10	Y1	"	209	15Y00	1Y	75-1Y5	5	Y0
Beryllium	5YTY		0TKY	"	Y0TY	36TK	72	75-1Y5	10	Y0
Boron	22Y		KY	"	209	Y0K	2K	75-1Y5	Y	Y0
badmium	19T5		YT1	"	Y0TY	3TK9	79	75-1Y5	5	Y0
balcium	57K0		KY0	"	K050	YK60	21	75-1Y5	1	Y0
bhromium	Y02		KTY	"	20T9	133	93	75-1Y5	2	Y0
boEalt	133	LK	2T3	"	Y0Y	.D	66	75-1Y5	1	Y0
bopper	216	L10	17	"	101	6Y1	193	75-1Y5	1K	Y0
Iron	5Y00	L10	KY0	"	K05	K660	133	75-1Y5	6	Y0
Qead	Y90		6TY	"	Y0Y	1YK	2Y	75-1Y5	0T3	Y0
Magnesium	1K7000	L10	Y10	"	K050	1K7000	0	75-1Y5	5	Y0



United States Environmental Protection Agency Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entaflohg CA 7(80)
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 061218
Reported: 07/19/06 11:06

Quality Control

Analyte	Result	Lualifiers / bomments	Luantitation Qimit	Units	Spike Qevel	Source Result	%R8b	%R8b Qimits	RPD	RPD Qimit
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Prepared: 07/06/06 Analyzed: 07/10/06

Metals Ey 8PA 6000/7000 Series Methods - Luality control

Batch B6G0016 - 8050B Sld Acid Dig -

Metals, ICP

Matrix SpiVe Dup (B6G0016-MSD2W) Source: 0606059-01

Manganese	KKY0	L10	Y1	"	Y0Y	K610	.R	75-1Y5	3	Y0
MolyEdenum	165		Y1	"	Y0Y	.D	2Y	75-1Y5	0T6	Y0
.ickel	191		Y1	"	Y0Y	33T2	72	75-1Y5	Y	Y0
Potassium	95Y0		Y100	"	K050	6390	77	75-1Y5	2	Y0
Selenium	602		KTY	"	209	.D	75	75-1Y5	3	Y0
Silver	YKT9		KTY	"	Y0TY	7T7K	25	75-1Y5	5	Y0
Sodium	10200	LK	Y10	"	K050	7950	70	75-1Y5	9	Y0
4hallium	652		Y1	"	209	.D	21	75-1Y5	3	Y0
Vanadium	Y10		2T3	"	Y0Y	32T9	25	75-1Y5	Y	Y0
Zinc	1100	L10	17	"	Y0Y	209	1KK	75-1Y5	5	Y0

Reference (B6G0016-SRM1W)

Aluminum	3Y3		Y00	mg/kg wet	309		105	6YTK9-137
Antimony	YK0		Y0	"	Y13		113	60T75-1K0
Arsenic	1060		YT0	"	930		11K	65T92-13K
Barium	5TY6	b1, J	10	"	5T30		99	K7T17-153
Beryllium	19T6		0TY0	"	12T2		10K	21T32-112
badmium	K1TK		1T0	"	K1T6		100	77T16-1Y3
balcium	175000		Y00	"	12K000		95	77T62-1YY
bhromium	10K		YT0	"	96T5		102	20T06-119
boEalt	136		KT0	"	1K0		97	2YTKY-112
bopper	6110		2T0	"	6620		91	25T73-11K
Iron	Y3000		Y00	"	Y1000		110	20T1K-1Y0
Qead	Y1Y		3T0	"	YYK		95	7KT2Y-1Y5
Magnesium	99Y00		100	"	113000		22	26TY2-11K
Manganese	Y0K		10	"	Y01		101	23T53-117
.ickel	57T1		10	"	56T2		101	76T52-1Y3
Potassium	.D	U	1000	"	10Y			0-370
Selenium	K3T5		YT0	"	37T0		112	K7T57-15Y
Silver	Y9T2	A-01	YT0	"	Y0T9		1K3	63T16-136
Sodium	.D	U	100	"	9YT2			0-Y99
4hallium	37T0		10	"	32T1		97	6KT57-135
Vanadium	70T2		KT0	"	65T2		102	20T55-119
Zinc	175		2T0	"	175		100	7YT97-1Y7

Reference (B6G0016-SRM2W)

Aluminum	3YY		Y00	mg/kg wet	309		10K	6YTK9-137
Antimony	Y3K		Y0	"	Y13		110	60T75-1K0
Arsenic	1050		YT0	"	930		113	65T92-13K
Barium	5T1K	b1, J	10	"	5T30		97	K7T17-153
Beryllium	12T9		0TY0	"	12T2		101	21T32-112
badmium	K0TK		1T0	"	K1T6		97	77T16-1Y3
balcium	169000		Y00	"	12K000		9Y	77T62-1YY
bhromium	103		YT0	"	96T5		107	20T06-119
boEalt	135		KT0	"	1K0		96	2YTKY-112
bopper	5220		2T0	"	6620		22	25T73-11K
Iron	YY700		Y00	"	Y1000		102	20T1K-1Y0



United States Environmental Protection Agency
Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entafloh CA 7(80(
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard
Project Number: R06S73
Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office
75 Hawthorne Street
San Francisco CA, 94105

SDG: 061218
Reported: 07/19/06 11:06

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%R8b	%R8b Limits	RPD	RPD Limit
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Prepared: 07/06/06 Analyzed: 07/10/06

Batch B6G0016 - 8050B Sld Acid Dig -

Metals Ey 8PA 6000/7000 Series Methods - Quality Control

Metals, ICP

Reference (B6G0016-SRM2W)

Lead	Y10		3T0	"	YYK		9K	7KT2Y-1Y5		
Magnesium	95200	A-01	100	"	113000		25	26TY2-11K		
Manganese	192		10	"	Y01		99	23T53-117		
Nickel	56T9		10	"	56T2		100	76T52-1Y3		
Potassium	.D	U	1000	"	10Y			0-370		
Selenium	KYT5		YT0	"	37T0		115	K7T57-15Y		
Silver	32T7	A-01	YT0	"	Y0T9		125	63T16-136		
Sodium	.D	U	100	"	9YT2			0-Y99		
Thallium	35T9		10	"	32T1		9K	6KT57-135		
Vanadium	69T0		KT0	"	65T2		105	20T55-119		
Zinc	17Y		2T0	"	175		92	7YT97-1Y7		

Prepared & Analyzed: 07/02/06

Batch B6G0026 - 7478 Hg Prep -

Metals Ey 8PA 6000/7000 Series Methods - Quality Control

Mercury

Blank (B6G0026-BL)1W

Mercury	.D	U	0T0Y5	mg/kg wet						
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Matrix Spike (B6G0026-MS2W)

Source: 0606059-01

Mercury	0TK23		0T05Y	mg/kg dry	0TK62	0T0K66	93	20-1Y0		Y0
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Matrix Spike Dup (B6G0026-MSD2W)

Source: 0606059-01

Mercury	0T515		0T05Y	mg/kg dry	0TK7Y	0T0K66	99	20-1Y0	6	Y0
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Reference (B6G0026-SRM1W)

Mercury	0TKY3		0T0Y5	mg/kg wet	0TKK7		95	20-1Y0		
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Prepared: 07/10/06 Analyzed: 07/11/06

Batch B6G0087 - Solids, Dry Weight

Conventional Chemistry Parameters Ey APHA/8PA Methods - Quality Control

(PrepW - Solids, Dry Weight)

Blank (B6G0087-BL)1W

% Solids	.D	U	0	%						
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Duplicate (B6G0087-DUP1W)

Source: 0606059-07

% Solids	KK		0	%		K3			Y	Y0
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United States Environmental Protection Agency
Region 9 Laboratory

9--1 Sp (62a S2ecc2g QrnshnoP)09g Entaflohg CA 7(80(
waloc:O590B (9)4)-00 F3x:O590B (9)4)-0)

Project Manager: Matthew Mitguard

Project Number: R06S73

Project: Halaco Integrated Assessment

States, Tribes and Site Assessment Office

75 Hawthorne Street

San Francisco CA, 94105

SDG: 061218

Reported: 07/19/06 11:06

Qualifiers and Comments

LK 4he matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this Eatch in Lb summary)

L10 4he analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicateT 4he reported spike recovery is not a meaningful measure of the dataset's analytical accuracyT

J 4he reported result for this analyte should Ee considered an estimated valueT

b1 4he reported concentration for this analyte is Eelow the quantitation limitT

A-01 4he recovery in the SRM did not meet Lb criteria for this analyteT

U .ot Detected

.R .ot Reported

Appendix H-3: CLP Soil Metals



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes & Site Assessment Section, SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: September 14, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	MY2JJ5
Laboratory:	Bonner Analytical Testing Company (BONNER)
Analysis:	CLP Total Metals
Samples:	8 Sediment and 12 Soil Samples (see Case Summary)
Collection Date:	June 20, 22, 23, and 26, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☐ FYI ☒ Action

SAMPLING ISSUES: ☒ Yes ☐ No

Data Validation Report

Case No.: 35429
SDG No.: MY2JJ5
Site: Halaco
Laboratory: Bonner Analytical Testing Company (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: September 14, 2006

I. CASE SUMMARY

Sample Information

Sediment Samples: MY2JJ5 through MY2JJ9, MY2JQ6, MY2JQ7, and MY2JQ8
Soil Samples: MY2JL1, MY2JL2, MY2JL3, MY2JL5 through MY2JL9, and MY2JM0 through MY2JM3
Concentration and Matrix: Low Concentration Sediment and Soil
Analysis: CLP Total Metals
SOW: ILM05.3
Collection Date: June 20, 22, 23, and 26, 2006
Sample Receipt Date: July 1, 2006
Preparation Date: July 7 and 10, 2006
Analysis Date: July 8, 10, and 12, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Background Samples (BG): MY2JM0 through MY2JM3 (See Additional Comments)
Field Duplicates (D1): MY2JJ7 and MY2M80 (See Additional Comments)
Field Duplicates (D2): MY2JL8 and MY2MB9 (See Additional Comments)
Duplicates (D3): MY2JQ7 and MY2MC3 (See Additional Comments)

Laboratory QC

Method Blanks & Associated Samples: Preparation Blank- Soil (PBS) and samples listed above
Matrix Spike: MY2JQ6S
Duplicate: MY2JQ6D
ICP Serial Dilution: MY2JQ6L

Analysis: CLP Total Metals

<u>Analyte</u>	<u>Sample Preparation and Digestion Date</u>	<u>Analysis Date</u>
ICP-AES Metals	July 7, 2006	July 8 and 12, 2006
Mercury	July 10, 2006	July 10, 2006
Percent Solids	July 7, 2006	July 10, 2006

CLP PO Action

Non-detected results for antimony and silver are rejected (R) since less than 30% of the matrix spike and less than 75% of the post-digestion spike were recovered. (See Comment A for affected samples.)

Sampling Issues

1. The samples were shipped in a cardboard box without a temperature indicator bottle or ice and arrived at the laboratory with a temperature of 25.5°C. Since the mercury samples arrived at a temperature greater than both the 4°±2 °C SOW limit and the 20.0°C Region 9 maximum temperature limit, results for mercury are estimated “J” or “UJ”.
2. The Traffic Report/Chain of Custody (TR/COC) record form did not specify a sample to be used for laboratory quality control (QC). The laboratory selected sample MY2JQ6 for QC analysis. The effect on data quality is not known.
3. Sample MY2JM5 is listed as both the field duplicate to sample MY2JR6 and a background sample on the Field QA/QC Summary Form. The effect on data quality is not known.

Additional Comments

Results for sample MY2M80, the field duplicate of sample MY2JJ7, are included in Case 35429 SDG MY2M69.

Results for sample MY2MB9, the field duplicate of sample MY2JL8, are included in Case 35429 SDG MY2MA3.

Results for sample MY2MC3, the field duplicate of sample MY2JQ7, are included in Case 35429 SDG MY2JR5.

The results for several analytes in background samples MY2JM0 through MY2JM3 exceed the respective contract required quantitation limits (CRQLs). Refer to Table 1A for background sample results.

The results for background soil samples MY2JM4 and MY2JM5 collected on June 20, 2006 with background soil samples MY2JM0 through MY2JM3 in this SDG can be found in SDG MY2JM4.

Samples MY2JL1, MY2JL2, MY2JL3, MY2JL5 through MY2JL9, MY2JM3, MY2JQ6, MY2JQ7, and MY2JQ8 were analyzed at a 3, 4, or 10-fold dilution for aluminum, manganese, potassium, sodium, or zinc due to analyte concentrations that exceed the instrument's linear range. No adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- ▼ Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration ILM05.3, March 2004; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	No	C
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	D
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	A, E
9.	ICP Serial Dilution Analysis	Yes	
10.	Field Duplicate Sample Analysis	No	F
11.	Sample Quantitation	Yes	B
12.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

- A. The following non-detected results are rejected and flagged "R" in Table 1A because matrix spike and post-digestion spike recoveries do not meet method QC limits.
- Antimony in samples MY2JJ5 through MY2JJ9, MY2JL2, and MY2JM0 through MY2JM3
 - Silver in all samples except MY2JM3

Matrix spike (MY2JQ6S) and post-digestion spike (MY2JQ6A) recovery results for antimony and silver did not meet the 75-125% criteria for accuracy. The percent recovery for each analyte is presented below and is based on an ideal recovery of 100%.

Analyte	Matrix Spike Recovery, %	Post-Digestion Spike Recovery, %
Antimony	26	42
Silver	0	0

The results reported for antimony and silver in samples listed above are below the method detection limit (MDL) and are considered unacceptable because less than 30% of the matrix spike and less than 75% of the post-digestion spike were recovered. Since both the post- and pre-digestion spikes did not meet the QC criteria, matrix effects may be present in the sample digestate that may depress the analyte signal during analysis. The low recoveries indicate an analytical deficiency and false negatives may exist.

Matrix spike sample analysis provides information about the effect of the sample matrix on sample preparation and measurement methodology.

- B. Results above the MDL but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

- C. The following results are estimated and flagged "J" or "UJ" in Table 1A due to inadequate sample preservation.

▼ Mercury in all samples

The samples arrived at the laboratory at a temperature of 25.5°C. Samples did not meet both the 4°±2 °C SOW temperature criterion or the 20.0°C Region 9 maximum temperature criterion. Sample results for mercury may be biased low and, where non-detected, false negatives may exist.

- D. The following result is reported as non-detected (U) in Table 1A due to low level continuing calibration blank (CCB) contamination.

▼ Beryllium in sample MY2JM0

The concentration for beryllium (0.077µg/L in CCB4) is greater than the MDL but less than the CRQL. Sample results greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the CRQL.

A continuing calibration blank (CCB) consists of deionized, distilled water and reagents. It is analyzed after the continuing calibration verification (CCV) standard, at a frequency of every 10 samples and at the end of the analytical run to monitor analyte carry-over.

- E. The following results are estimated and flagged "J", "J-", or "UJ" in Table 1A because matrix spike recovery results are outside method QC limits.

- ▼ Antimony in samples MY2JL1, MY2JL3, MY2JL5 through MY2JL9, MY2JQ6, MY2JQ7, and MY2JQ8
▼ Selenium in all samples
▼ Silver in sample MY2JM3

Matrix spike recovery results for antimony, selenium, and silver in QC sample MY2JQ6S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for the analytes are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	26	-74
Selenium	69	-31
Silver	0	-100

Results above the MDL are considered quantitatively uncertain. Results reported for antimony, selenium, and silver in the samples listed above may be biased low.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes fall outside the 75-125% control limits, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery results for sample MY2JQ6A were obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	42
Selenium	177
Silver	0

Since both the post- and pre-digestion spikes did not meet the QC criteria, matrix effects may be present in the sample digestate which may interfere with accurate analysis.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

- F. The following relative percent differences (RPDs) or absolute differences were obtained for field duplicate pairs listed below.

	MY2JJ7 D1 MY2M80 D1	MY2JL8 D2 MY2MB9 D2	MY2JQ7 D3 MY2MC3 D3
Analyte	Result	Result	Result
Aluminum	52 RPD	--	--
Barium	--	--	53 RPD
Calcium	101 RPD	--	--
Chromium	51 RPD	--	--
Cobalt	--	--	16.8 mg/kg, difference
Copper	81 RPD	--	--
Iron	49 RPD	--	46 RPD
Lead	4.4 mg/kg, difference	--	48 RPD
Magnesium	1,200 mg/kg, difference	--	--
Manganese	74 RPD	--	36 RPD
Vanadium	--	36 RPD	--
Zinc	42.5 mg/kg, difference	--	--

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ≤ 35 RPD or ≤ 2 times CRQL absolute difference criteria for precision. The effect on the quality of the data is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, high levels of solids in the sample, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS

Page 1 of 4

Case No. : 35429

SDG No. : MY2JJ5

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 14, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SDF2-230606-1535			SDF3-230606-1545			SDF4-230606-1620			SDF5-230606-1625			SDF6-260606-1125			SSN54-220606-1315		
Sample ID :	MY2JJ5			MY2JJ6			MY2JJ7 D1			MY2JJ8			MY2JJ9			MY2JL1		
Collection Date :	6/23/2006			6/23/2006			6/23/2006			6/23/2006			6/26/2006			6/22/2006		
Matrix :	Sediment			Sediment			Sediment			Sediment			Sediment			Soil		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	1960			10400			2160		F	18400			7800			121000		
ANTIMONY	7.7U	R	A	9.8U	R	A	7.8U	R	A	10.4U	R	A	14.3U	R	A	4.5L	J-	E
ARSENIC	1.0L	J	B	2.5			0.93L	J	B	4.6			4.5			3.6		
BARIUM	40.3			348			39.9			294			155			1820		
BERYLLIUM	0.18L	J	B	1.3			0.15L	J	B	1.7			1.2L	J	B	8.4		
CADMIUM	0.39L	J	B	0.83			0.070L	J	B	0.84L	J	B	0.98L	J	B	4.3		
CALCIUM	10200			47400			8730		F	39300			106000			2550		
CHROMIUM	5.7			23.3			6.1		F	35.7			19.4			344		
COBALT	1.7L	J	B	5.2L	J	B	1.3L	J	B	8.1L	J	B	4.5L	J	B	8.6		
COPPER	13.3			161			15.4		F	250			82.5			3750		
IRON	3700			12000			4100		F	19900			14900			11000		
LEAD	3.6			29.6			3.4		F	29.4			24.2			246		
MAGNESIUM	1800			8120			1400		F	11600			6690			77500		
MANGANESE	120			350			68.6		F	639			543			5720		
MERCURY	0.13U	J	C	0.16U	J	C	0.13U	J	C	0.17U	J	C	0.24U	J	C	0.13U	J	C
NICKEL	5.0L			18.8			5.4			29.4			16.1			199		
POTASSIUM	695			2380			488L	J	B	4020			2860			7250		
SELENIUM	4.5U	J	E	5.7U	J	E	4.6U	J	E	6.1U	J	E	8.4U	J	E	4.4U	J	E
SILVER	1.3U	R	A	1.6U	R	A	1.3U	R	A	1.7U	R	A	2.4U	R	A	1.3U	R	A
SODIUM	3040			6340			1010			2890			9500			39900		
THALLIUM	3.2U			4.1U			3.3U			4.3U			6.0U			3.1U		
VANADIUM	6.5			22.1			6.8			36.4			25.8			41.2		
ZINC	44.7			350			28.8		F	271			238			5200		
Percent Solids	78.1%			61.2%			76.6%			57.8%			41.9%			79.5%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

Page 2 of 4

Case No. : 35429

SDG No. : MY2JJ5

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 14, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SSN55-220606-1335			SSN58-220606-1350			SSN60-220606-1400			SSN62-220606-1410			SSN74-220606-1519			SSN75-220606-1524		
Sample ID :	MY2JL2			MY2JL3			MY2JL5			MY2JL6			MY2JL7			MY2JL8 D2		
Collection Date :	6/22/2006			6/22/2006			6/22/2006			6/22/2006			6/22/2006			6/22/2006		
Matrix :	Soil			Soil			Soil			Soil			Soil			Soil		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	16300			79200			82400			80600			174000			114000		
ANTIMONY	6.9U	R	A	6.4L	J-	BE	3.5L	J-	BE	4.2L	J-	BE	5.7L	J-	BE	6.7L	J-	BE
ARSENIC	3.2			9.7			4.9			2.0			0.54L	J	B	6.6		
BARIUM	296			6190			2680			1880			1220			2290		
BERYLLIUM	1.5			15.9			10.2			7.3			6.7			12.5		
CADMIUM	0.56L	J	B	4.0			5.1			2.6			6.0			5.9		
CALCIUM	17000			9340			21000			8610			6700			9820		
CHROMIUM	34.1			119			167			167			315			363		
COBALT	6.1			7.7L	J	B	8.8			8.6			8.2			9.6		
COPPER	169			1020			1620			1470			3500			3790		
IRON	14500			10100			12900			10900			8930			13200		
LEAD	53.4			149			207			136			238			250		
MAGNESIUM	19100			111000			61500			48100			35200			58200		
MANGANESE	426			2210			2700			2210			1600			2610		
MERCURY	0.11U	J	C	0.16U	J	C	0.15U	J	C	0.13U	J	C	0.13U	J	C	0.12U	J	C
NICKEL	30.5			51.7			87.7			90.9			163			265		
POTASSIUM	6520			39300			11400			23000			14600			19900		
SELENIUM	4.0U	J	E	5.5U	J	E	5.3U	J	E	4.6U	J	E	4.6U	J	E	4.3U	J	E
SILVER	1.1U	R	A	1.6U	R	A	1.5U	R	A	1.3U	R	A	1.3U	R	A	1.2U	R	A
SODIUM	12500			45800			17100			23300			20500			24800		
THALLIUM	2.9U			3.9U			3.8U			3.3U			0.99L	J	B	3.1U		
VANADIUM	34.3			46.4			48.5			51.3			56.7			44.7		F
ZINC	253			1240			1660			1230			2520			5950		
Percent Solids	87.1%			63.7%			66.5%			76.0%			75.4%			81.4%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : MY2JJ5

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 14, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SSN86-220606-1630			SSN94-200606-1406			SSN95-200606-1433			SSN96-200606-1436			SSN97-200606-1440			SWL21-230606-1411		
Sample ID :	MY2JL9			MY2JM0 BG			MY2JM1 BG			MY2JM2 BG			MY2JM3 BG			MY2JQ6		
Collection Date :	6/22/2006			6/20/2006			6/20/2006			6/20/2006			6/20/2006			6/23/2006		
Matrix :	Soil			Soil			Soil			Soil			Soil			Sediment		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	67300			16400			10400			9820			10800			199000		
ANTIMONY	4.3L	J-	BE	6.6U	R	A	6.3U	R	A	6.5U	R	A	6.6U	R	A	11.8	J-	E
ARSENIC	3.8			2.7			4.4			5.1			5.9			3.3		
BARIUM	2540			54.6			170			155			220			2300		
BERYLLIUM	13.4			0.55U		D	0.59			0.57			0.62			19.7		
CADMIUM	3.4			0.18L	J	B	0.83			1.1			1.3			17.0		
CALCIUM	17400			10700			8040			7760			9030			6970		
CHROMIUM	147			22.1			21.8			19.1			29.7			503		
COBALT	8.7			19.8			7.7			7.9			8.1			12.2		
COPPER	1370			30.9			37.3			32.1			61.4			5960		
IRON	12200			41600			21200			20400			21600			11800		
LEAD	160			8.0			28.0			25.6			39.1			736		
MAGNESIUM	47200			13600			6870			8690			9810			60500		
MANGANESE	2030			643			328			457			300			2980		
MERCURY	0.14U	J	C	0.11U	J	C	0.22	J	C	0.20	J	C	0.66	J	C	0.11U	J	C
NICKEL	88.2			24.7			20.7			20.7			22.2			244		
POTASSIUM	19500			4410			4430			4360			5160			4720		
SELENIUM	5.0U	J	E	3.9U	J	E	3.7U	J	E	3.8U	J	E	3.9U	J	E	1.8L	J-	E
SILVER	1.4U	R	A	1.1U	R	A	1.0U	R	A	1.1U	R	A	2.0	J-	E	1.1U	R	A
SODIUM	24800			6710			465L	J	B	5260			10700			543U		
THALLIUM	3.6U			1.3L	J	B	0.84L	J	B	0.86L	J	B	0.77L	J	B	6.5		
VANADIUM	42.0			50.1			34.7			34.5			36.2			68.9		
ZINC	1590			75.7			145			118			242			5210		
Percent Solids	69.8%			90.9%			95.8%			92.2%			90.6%			92.0%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

Page 4 of 4

Case No. : 35429

SDG No. : MY2JJ5

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 14, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SWL22-230606-1418			SWL3-230606-0835			MDL			CRQL								
Sample ID :	MY2JQ7 D3			MY2JQ8														
Collection Date :	6/23/2006			6/23/2006														
Matrix :	Sediment			Sediment														
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	135000			96400			0.18			20.0								
ANTIMONY	9.2L	J-	BE	8.1L	J-	BE	0.72			6.0								
ARSENIC	7.1			4.3			0.25			1.0								
BARIUM	4620		F	3560			0.05			20.0								
BERYLLIUM	10.3			9.7			0.004			0.50								
CADMIUM	3.6			3.1			0.02			0.50								
CALCIUM	4070			3230			3.46			500								
CHROMIUM	281			166			0.13			1.0								
COBALT	10.3		F	7.0L	J	B	0.04			5.0								
COPPER	2690			2120			0.11			2.5								
IRON	8540		F	8770			0.53			10.0								
LEAD	305		F	164			0.31			1.0								
MAGNESIUM	64700			69900			0.31			500								
MANGANESE	1730		F	1530			0.02			1.5								
MERCURY	0.16U	J	C	0.14U	J	C	0.03			0.10								
NICKEL	124			81.8			0.09			4.0								
POTASSIUM	5000			2710			0.55			500								
SELENIUM	5.0L	J-	BE	4.9U	J	E	0.97			3.5								
SILVER	1.6U	R	A	1.4U	R	A	0.08			1.0								
SODIUM	4620			1420			10.9			500								
THALLIUM	4.0U			3.5U			0.56			2.5								
VANADIUM	54.9			41.1			0.08			5.0								
ZINC	2520			1860			0.18			6.0								
Percent Solids	63.1%			71.4%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes & Site Assessment Section, SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: September 20, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	MY2JM4
Laboratory:	Bonner Analytical Testing Company (BONNER)
Analysis:	CLP Total Metals
Samples:	11 Sediment and 9 Soil Samples (see Case Summary)
Collection Date:	June 19, 20, 21, 23, 26, and 28, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☒ FYI ☐ Action

SAMPLING ISSUES: ☒ Yes ☐ No

Data Validation Report

Case No.: 35429
SDG No.: MY2JM4
Site: Halaco
Laboratory: Bonner Analytical Testing Company (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: September 20, 2006

I. CASE SUMMARY

Sample Information

Sediment Samples: MY2JQ4, MY2JQ5, MY2JQ9, MY2JR0 through MY2JR4, MY2M74, MY2M75, and MY2M76

Soil Samples: MY2JK0 through MY2JK5, MY2JL4, MY2JM4, and MY2JM5
Concentration and Matrix: Low Concentration Sediment and Soil
Analysis: CLP Total Metals
SOW: ILM05.3
Collection Date: June 19, 20, 21, 23, 26, and 28, 2006
Sample Receipt Date: July 1, 2006
Preparation Date: July 7, 10, and 11, 2006
Analysis Date: July 10, 11, and 12, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Background Samples (BG): MY2JM4, MY2JM5, MY2JQ9, MY2JR0 through MY2JR4, MY2M74, MY2M75, and MY2M76 (See Additional Comments)
Field Duplicates (D1): MY2JM5 and MY2JR6 (See Additional Comments)

Laboratory QC

Method Blanks & Associated Samples: Preparation Blank-Soil (PBS) and samples listed above
Matrix Spike: MY2JM5S
Duplicate: MY2JM5D
ICP Serial Dilution: MY2JM5L

Analysis: CLP Total Metals

<u>Analyte</u>	<u>Sample Preparation and Digestion Date</u>	<u>Analysis Date</u>
ICP-AES Metals	July 10, 2006	July 11 and 12, 2006
Mercury	July 11, 2006	July 11, 2006
Percent Solids	July 7, 2006	July 10, 2006

CLP PO Action

None.

Sampling Issues

1. The samples were shipped in a cardboard box without a temperature indicator bottle or ice and arrived at the laboratory with a temperature of 25.5°C. Since the mercury samples arrived at a temperature greater than both the 4°±2°C SOW limit and the 20.0°C Region 9 maximum temperature limit, results for mercury are estimated “J” or “UJ”.
2. The Traffic Report/Chain of Custody (TR/COC) record form did not specify a sample to be used for laboratory quality control (QC). The laboratory selected sample MY2JM5 for QC analysis. The effect on data quality is not known.
3. Sample MY2JM5 is listed as both the field duplicate to sample MY2JR6 and a background sample on the Field QA/QC Summary Form. The effect on data quality is not known.

Additional Comments

Results for sample MY2JR6, the field duplicate of sample MY2JM5, are included in Case 35429 SDG MY2JR5.

The results for background soil samples MY2JM0 through MY2JM3, collected on June 20, 2006 with samples MY2JM4 and MY2JM5 in this SDG, can be found in SDG MY2JJ5.

Samples MY2JK2 through MY2JK5, and MY2JL4 were analyzed at a 2, 3, or 7-fold dilution due to analyte concentrations that exceed the instrument's linear range. No adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- ▼ Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration ILM05.3, March 2004; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	No	B
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	C
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	D
9.	ICP Serial Dilution Analysis	Yes	
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	Yes	
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

- A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

- B. The following results are estimated and flagged "J" or "UJ" in Table 1A due to inadequate sample preservation.

▼ Mercury in all samples

The samples arrived at the laboratory at a temperature of 25.5°C. Samples did not meet either the 4°±2 °C SOW temperature criterion or the 20.0°C Region 9 maximum temperature criterion. Sample results for mercury may be biased low and, where non-detected, false negatives may exist.

- C. The following results are reported as non-detected (U) in Table 1A due to low level preparation blank (PBS) and continuing calibration blank (CCB) contamination.

▼ Sodium in samples MY2JK0, MY2JK1, MY2JQ9, MY2JR0 through MY2JR4, and MY2M76

The concentration for sodium (74.4 mg/kg) in preparation blank PBS is greater than the MDL but less than the CRQL. The values for sodium in the CCBs ranged from a low of 33.9 mg/kg to a high of 57.0 mg/kg and are greater than the MDL but less than the CRQL. Sample results greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the CRQL.

A preparation blank is an analytical control that contains distilled, deionized water, or baked sand for solid matrices, and reagents, which is carried through the entire analytical procedure. The preparation blank is used to determine the level of contamination introduced by the laboratory during preparation and analysis.

A continuing calibration blank (CCB) consists of deionized, distilled water and reagents. It is analyzed after the continuing calibration verification (CCV) standard, at a frequency of every 10 samples and at the end of the analytical run to monitor analyte carry-over.

- D. The following results are estimated and flagged "J" or "UJ" in Table 1A because a matrix spike recovery result is outside method QC limits.

▼ Antimony in all samples

Matrix spike recovery result for antimony in QC sample MY2JM5S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for antimony are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	19	-81

Results above the MDL are considered quantitatively uncertain. Results reported for antimony in all the samples may be biased low.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes fall outside the 75-125% control limits, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery result for sample MY2JM5A was obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	85

Since the post-digestion spike recovery was acceptable, the low pre-digestion spike recovery result (19%) obtained for antimony may indicate sample non-homogeneity, poor laboratory technique, or matrix effects which may interfere with accurate analysis, depressing the analytical result.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS

Page 1 of 4

Case No. : 35429 SDG No. : MY2JM4
 Site : HALACO ENGINEERING
 Lab : BONNER ANALYTICAL TESTING CO
 Reviewer : Stan Kott, ESAT/LDC
 Date : September 20, 2006

Table 1A

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
 Soil Samples for Total Metals

Station Location :	SSA7-260606-1420			SSA8-260606-1425			SSN10/1-190606-1714			SSN1/1-230606-0904			SSN15-260606-0840			SSN2/8-230606-1005		
Sample ID :	MY2JK0			MY2JK1			MY2JK2			MY2JK3			MY2JK4			MY2JK5		
Collection Date :	6/26/2006			6/26/2006			6/19/2006			6/23/2006			6/26/2006			6/23/2006		
Matrix :	Soil			Soil			Soil			Soil			Soil			Soil		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	7020			7100			8770			62500			72800			16300		
ANTIMONY	6.2U	J	D	6.2U	J	D	3.2L	J	AD	6.9U	J	D	7.5U	J	D	3.2L	J	AD
ARSENIC	3.5			3.6			19.9			1.0L	J	A	1.2U			14.1		
BARIUM	105			101			413			831			5960			682		
BERYLLIUM	0.42L	J	A	0.42L	J	A	0.23L	J	A	17.9			26.4			0.23L	J	A
CADMIUM	1.3			1.0			11.7			2.9			5.9			14.5		
CALCIUM	7380			7710			16700			10200			13200			41000		
CHROMIUM	14.4			13.0			44.0			107			318			47.7		
COBALT	5.3			5.3			21.8			3.7L	J	A	12.4			15.5		
COPPER	16.3			16.1			555			954			2220			1400		
IRON	14600			14800			113000			11500			16700			74700		
LEAD	9.6			8.3			1720			84.3			205			7280		
MAGNESIUM	4260			4260			3410			32500			109000			4360		
MANGANESE	254			256			732			6110			4520			597		
MERCURY	0.058L	J	AB	0.13	J	B	0.24	J	B	0.069L	J	AB	0.096L	J	AB	0.35	J	B
NICKEL	14.8			14.4			63.7			41.5			164			57.9		
POTASSIUM	2960			2840			4300			5080			4090			6370		
SELENIUM	3.6U			3.6U			4.0L	J	A	2.2L	J	A	2.6L	J	A	3.1L	J	A
SILVER	1.0U			1.0U			1.9			1.1U			1.2U			5.4		
SODIUM	515U		C	515U		C	1960			4110			5400			5350		
THALLIUM	2.6U			2.6U			2.9U			2.9U			3.1U			3.2U		
VANADIUM	25.0			24.7			18.3			26.7			45.6			21.6		
ZINC	52.9			53.4			1700			1140			3260			22900		
Percent Solids	97.1%			97.0%			85.5%			87.0%			80.2%			77.6%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

Page 2 of 4

Case No. : 35429 SDG No. : MY2JM4
 Site : HALACO ENGINEERING
 Lab : BONNER ANALYTICAL TESTING CO
 Reviewer : Stan Kott, ESAT/LDC
 Date : September 20, 2006

Table 1A

QUALIFIED DATA
Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
 Soil Samples for Total Metals

Station Location :	SSN5/8-230606-1203			SSN98-200606-1447			SSN99-200606-1452			SWL13-230606-1115			SWL19-230606-1212			SWL31-210606-1720		
Sample ID :	MY2JL4			MY2JM4 BG			MY2JM5 D1/BG			MY2JQ4			MY2JQ5			MY2JQ9 BG		
Collection Date :	6/23/2006			6/20/2006			6/20/2006			6/20/2006			6/23/2006			6/21/2006		
Matrix :	Soil			Soil			Soil			Sediment			Sediment			Sediment		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	10200			10200			9140			104000			187000			5810		
ANTIMONY	12.9	J	D	6.1U	J	D	6.5U	J	D	11.9U	J	D	12.7U	J	D	6.4U	J	D
ARSENIC	16.5			3.5			2.4			1.2L	J	AB	2.1U			1.3		
BARIUM	6920			142			139			1310			1730			748		
BERYLLIUM	0.24L	J	A	0.58			0.50L	J	A	7.1			10.8			2.8		
CADMIUM	12.8			1.4			0.91			3.5			9.6			1.0		
CALCIUM	25400			9070			4630			7080			6920			20100		
CHROMIUM	67.6			18.4			17.5			213			446			17.2		
COBALT	23.3			7.6			6.8			7.3L	J	AB	10.4L	J	A	3.0L	J	A
COPPER	560			22.8			24.8			2440			5170			76.5		
IRON	139000			20100			18400			8190			11200			7810		
LEAD	1840			17.6			19.0			263			553			35.0		
MAGNESIUM	4970			7450			12300			22000			26700			8720		
MANGANESE	1140			342			245			879			1640			322		
MERCURY	0.15	J	B	0.062L	J	AB	0.081L	J	AB	0.12L	J	AB	0.21U	J	B	0.11U	J	B
NICKEL	95.9			20.5			17.4			114			227			12.2		
POTASSIUM	6140			4700			5070			3270			2840			1570		
SELENIUM	4.9			3.6U			3.8U			4.0L	J	AB	4.7L	J	A	1.4L	J	A
SILVER	3.8			1.0U			1.1U			2.0U			2.1U			1.1U		
SODIUM	2680			565			22200			1320			1980			532U		C
THALLIUM	3.4U			2.6U			2.7U			5.0U			5.3U			2.7U		
VANADIUM	20.2			33.8			28.9			42.6			68.2			14.2		
ZINC	5160			83.2			93.5			1890			3810			138		
Percent Solids	73.6%			97.7%			92.7%			50.3%			47.2%			93.9%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

Page 3 of 4

Case No. : 35429 SDG No. : MY2JM4

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO

Reviewer : Stan Kott, ESAT/LDC

Date : September 20, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for Total Metals

Station Location :	SWL32-210606-1725			SWL33-210606-1730			SWL34-210606-1735			SWL35-210606-1740			SWL36-210606-1745			SDF11-280606-1535		
Sample ID :	MY2JR0 BG			MY2JR1 BG			MY2JR2 BG			MY2JR3 BG			MY2JR4 BG			MY2M74 BG		
Collection Date :	6/21/2006			6/21/2006			6/21/2006			6/21/2006			6/21/2006			6/28/2006		
Matrix :	Sediment			Sediment			Sediment			Sediment			Sediment			Sediment		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	3050			1510			4130			2720			3210			1520		
ANTIMONY	0.64L	J	AD	8.5U	J	D	7.4U	J	D	8.3U	J	D	6.1U	J	D	8.1U	J	D
ARSENIC	1.6			1.4U			1.9			0.72L	J	A	1.8			1.3U		
BARIUM	91.8			22.0L	J	A	174			111			222			25.0L	J	A
BERYLLIUM	0.32L	J	A	0.11L	J	A	0.42L	J	A	0.47L	J	A	0.80			0.10L	J	A
CADMIUM	0.63			0.19L	J	A	0.83			0.43L	J	A	0.57			0.41L	J	A
CALCIUM	7840			6790			18700			9350			12100			18800		
CHROMIUM	6.9			3.7			9.3			6.4			7.4			3.2		
COBALT	2.7L	J	A	1.3L	J	A	3.0L	J	A	1.9L	J	A	2.2L	J	A	1.4L	J	A
COPPER	11.2			3.5L	J	A	18.3			13.4			20.3			5.6		
IRON	6680			3690			9080			5870			7280			3170		
LEAD	13.5			4.3			28.7			17.3			18.3			3.2		
MAGNESIUM	2280			1930			3440			2460			2910			1310		
MANGANESE	197			55.1			286			119			200			97.5		
MERCURY	0.10U	J	B	0.14U	J	B	0.12U	J	B	0.078L	J	AB	0.11	J	B	0.13U	J	B
NICKEL	7.8			3.6L	J	A	10.0			6.3			7.0			3.4L	J	A
POTASSIUM	1330			528L	J	A	1790			1100			1260			617L	J	A
SELENIUM	3.6U			5.0U			4.3U			4.8U			3.5U			4.7U		
SILVER	1.0U			1.4U			1.2U			1.4U			1.0U			1.3U		
SODIUM	509U		C	708U		C	614U		C	691U		C	505U		C	1300		
THALLIUM	2.5U			3.5U			3.1U			3.5U			2.5U			3.4U		
VANADIUM	11.5			6.0L	J	A	14.2			9.0			10.3			4.8L	J	A
ZINC	35.3			17.4			78.6			47.5			50.4			40.1		
Percent Solids	98.2%			70.6%			81.4%			72.4%			99.0%			74.2%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

Page 4 of 4

Case No. : 35429 SDG No. : MY2JM4

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO

Reviewer : Stan Kott, ESAT/LDC

Date : September 20, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for Total Metals

Station Location :	SDF12-280606-1545			SDF13-280606-1555			MDL			CRQL								
Sample ID :	MY2M75 BG			MY2M76 BG														
Collection Date :	6/28/2006			6/28/2006														
Matrix :	Sediment			Sediment														
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	1070			246			0.72			20.0								
ANTIMONY	268	J	D	8.0U	J	D	0.47			6.0								
ARSENIC	268			1.3U			0.44			1.0								
BARIUM	1090			0.35L	J	A	0.06			20.0								
BERYLLIUM	27.1			0.19L	J	A	0.005			0.50								
CADMIUM	137			0.67U			0.02			0.50								
CALCIUM	2640			222L	J	A	2.3			500								
CHROMIUM	108			1.3U			0.05			1.0								
COBALT	270			6.7U			0.08			5.0								
COPPER	135			8.5			0.12			2.5								
IRON	537			1.4L	J	A	0.34			10.0								
LEAD	275			2.4			0.45			1.0								
MAGNESIUM	2650			669U			0.37			500								
MANGANESE	269			0.11L	J	A	0.02			1.5								
MERCURY	0.13U	J	B	0.13U	J	B	0.04			0.10								
NICKEL	270			0.37L	J	A	0.09			4.0								
POTASSIUM	2640			669U			0.74			500								
SELENIUM	266			6.4			1.1			3.5								
SILVER	136			4.1			0.31			1.0								
SODIUM	2670			669U		C	10.9			500								
THALLIUM	272			2.4L	J	A	0.32			2.5								
VANADIUM	266			5.5L	J	A	0.09			5.0								
ZINC	267			2.2L	J	A	0.16			6.0								
Percent Solids	76.1%			74.7%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes & Site Assessment Section, SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: September 14, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	MY2JR5
Laboratory:	Bonner Analytical Testing Company (BONNER)
Analysis:	CLP Total Metals
Samples:	2 Sediment and 1 Soil Samples (see Case Summary)
Collection Date:	June 20 and 23, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☒ FYI ☐ Action

SAMPLING ISSUES: ☒ Yes ☐ No

Data Validation Report

Case No.: 35429
SDG No.: MY2JR5
Site: Halaco
Laboratory: Bonner Analytical Testing Company (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: September 14, 2006

I. CASE SUMMARY

Sample Information

Sediment Samples: MY2JR5 and MY2MC3
Soil Sample: MY2JR6
Concentration and Matrix: Low Concentration Sediment and Soil
Analysis: CLP Total Metals
SOW: ILM05.3
Collection Date: June 20 and 23, 2006
Sample Receipt Date: July 1, 2006
Preparation Date: July 7 and 11, 2006
Analysis Date: July 10, 11, 13, and 14, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Background Samples (BG): (See Additional Comments)
Field Duplicates (D1): MY2JR6 and MY2JM5 (See Additional Comments)
Field Duplicates (D2): MY2MC3 and MY2LQ7 (See Additional Comments)

Laboratory QC

Method Blanks & Associated Samples: Preparation Blank- Soil (PBS) and samples listed above
Matrix Spike: MY2JQ6S
Duplicate: MY2JQ6D
ICP Serial Dilution: MY2JQ6L

Analysis: CLP Total Metals

<u>Analyte</u>	<u>Sample Preparation and Digestion Date</u>	<u>Analysis Date</u>
ICP-AES Metals	July 7, 2006	July 13 and 14, 2006
Mercury	July 11, 2006	July 11, 2006
Percent Solids	July 7, 2006	July 10, 2006

CLP PO Action

None.

Sampling Issues

1. The samples were shipped in a cardboard box without a temperature indicator bottle or ice and arrived at the laboratory with a temperature of 25.5°C. Since the mercury samples arrived at a temperature greater than both the 4°±2 °C SOW limit and the 20.0°C Region 9 maximum temperature limit, results for mercury are estimated “J” or “UJ”.
2. The Traffic Report/Chain of Custody (TR/COC) record form did not specify a sample to be used for laboratory quality control (QC). The laboratory selected sample MY2JQ6 for QC analysis. The effect on data quality is not known.
3. Sample MY2JM5 is listed as both the field duplicate to sample MY2JR6 and a background sample on the Field QA/QC Summary Form. The effect on data quality is not known.

Additional Comments

Results for sample MY2JM5, the field duplicate of sample MY2JR6, are included in Case 35429 SDG MY2JM4.

Results for sample MY2JQ7, the field duplicate of sample MY2MC3, are included in Case 35429 SDG MY2JJ5.

The results for background soil samples MY2JM0 through MY2JM3 and background soil samples MY2JM4 and MY2JM5, collected on June 20, 2006 with sample MY2JR6 in this SDG, can be found in SDG MY2JJ5 and SDG MY2JM4, respectively.

Sample MY2JR6 was analyzed at a 3-fold dilution for sodium and samples MY2JR5 and MY2MC3 were analyzed at a 5-fold dilution for aluminum and barium due to analyte concentrations that exceed the instrument's linear range. No adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- ▼ Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration ILM05.3, March 2004; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	No	B
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	C
9.	ICP Serial Dilution Analysis	No	D
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	E
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

- A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

- B. The following results are estimated and flagged "J" or "UJ" in Table 1A due to inadequate sample preservation.

▼ Mercury in all samples

The samples arrived at the laboratory at a temperature of 25.5°C. Samples did not meet either the 4°±2 °C SOW temperature criterion or the 20.0°C Region 9 maximum temperature criterion. Sample results for mercury may be biased low and, where non-detected, false negatives may exist.

- C. The following results are estimated and flagged "J" or "UJ" in Table 1A because a matrix spike recovery result is outside method QC limits.

▼ Antimony in all samples

Matrix spike recovery result for antimony in QC sample MY2JR6S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for antimony are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	21	-79

Results above the MDL are considered quantitatively uncertain. Results reported for antimony in all the samples may be biased low.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes fall outside the 75-125% control limits, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery result for sample MY2JR6A was obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	93

Since the post-digestion spike recovery was acceptable, the low pre-digestion spike recovery result (21%) obtained for antimony may indicate sample non-homogeneity, poor laboratory technique, or matrix effects which may interfere with accurate analysis, depressing the analytical result.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

- D. The following results are estimated and flagged "J" in Table 1A because an ICP serial dilution result is outside method QC limits.

▼ Cobalt in all samples

The percent difference for the ICP serial dilution analysis of sample MY2JR6L did not meet the 10% criterion for cobalt as shown below.

Analyte	% Difference
Cobalt	+12

Results reported for cobalt in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The result for the diluted sample was higher than the original. Therefore, the reported sample results for cobalt may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

- E. The following relative percent differences (RPDs) or absolute difference were obtained for the field duplicate pair listed below.

MY2JQ7 D3 MY2MC3 D3	
Analyte	Result
Barium	53 RPD
Cobalt	16.8 mg/kg difference
Iron	46 RPD
Lead	48 RPD
Manganese	36 RPD

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ▼35 RPD or ▼2 times CRQL absolute difference criteria for precision. The effect on the quality of the data is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, high levels of solids in the sample, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS

Page 1 of 1

Case No. : 35429

SDG No. : MY2JR5

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 14, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SWL5-230606-0842			SSN100-200606-0912			SWL100-230606-1400			MDL			CRQL					
Sample ID :	MY2JR5			MY2JR6 D1			MY2MC3 D2											
Collection Date :	6/23/2006			6/20/2006			6/23/2006											
Matrix :	Sediment			Soil			Sediment											
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	205000			11000			148000			0.72			20.0					
ANTIMONY	9.0U	J	C	1.3L	J	AC	9.6L	J	AC	0.47			6.0					
ARSENIC	1.5			3.8			8.9			0.25			1.0					
BARIUM	2760			158			7960		E	0.06			20.0					
BERYLLIUM	8.0			0.57			13.3			0.005			0.50					
CADMIUM	5.9			1.0			4.3			0.02			0.50					
CALCIUM	4890			5630			4280			2.3			500					
CHROMIUM	343			19.8			372			0.05			1.0					
COBALT	11.4	J	D	7.7	J	D	27.1	J	DE	0.08			5.0					
COPPER	4720			28.1			3500			0.12			2.5					
IRON	17400			21000			13600		E	0.34			10.0					
LEAD	473			20.3			496		E	0.45			1.0					
MAGNESIUM	65200			13800			92400			0.37			500					
MANGANESE	2120			296			2490		E	0.02			1.5					
MERCURY	0.19	J	B	0.10L	J	AB	0.18U	J	B	0.04			0.10					
NICKEL	210			19.4			163			0.09			4.0					
POTASSIUM	10700			5530			6360			0.74			500					
SELENIUM	5.1L	J	A	1.8L	J	A	8.9			1.1			3.5					
SILVER	1.5U			1.1U			1.8U			0.31			1.0					
SODIUM	9680			24700			6220			10.9			500					
THALLIUM	0.85L	J	A	0.59L	J	A	4.4U			0.32			2.5					
VANADIUM	83.0			34.0			66.0			0.09			5.0					
ZINC	3010			101			3310			0.16			6.0					
Percent Solids	66.9%			91.5%			56.7%			N/A			N/A					

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes & Site Assessment Section, SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: September 22, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	MY2M69
Laboratory:	Bonner Analytical Testing Company (BONNER)
Analysis:	CLP Total Metals
Samples:	20 Sediment Samples (see Case Summary)
Collection Date:	June 20, 21, 23, 28, and 29, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☒ FYI ☐ Action

SAMPLING ISSUES: ☒ Yes ☐ No

Data Validation Report

Case No.: 35429
SDG No.: MY2M69
Site: Halaco
Laboratory: Bonner Analytical Testing Company (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: September 22, 2006

I. CASE SUMMARY

Sample Information

Sediment Samples: MY2M69 through MY2M73, MY2M77, MY2M78, MY2M79, MY2M80 through MY2M89, MY2MA1, and MY2MA2
Concentration and Matrix: Low Concentration Sediment
Analysis: CLP Total Metals
SOW: ILM05.3
Collection Date: June 20, 21, 23, 28, and 29, 2006
Sample Receipt Date: July 1, 2006
Preparation Date: July 7 and 11, 2006
Analysis Date: July 10, 11, and 14, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Background Samples (BG): MY2JM77 through MY2M79 and MY2M81 through MY2M86
Field Duplicates (D1): MY2M80 and MY2JJ7 (See Additional Comments)
Field Duplicates (D2): MY2M88 and MY2MA4 (See Additional Comments)

Laboratory QC

Method Blanks & Associated Samples: Preparation Blank-Soil (PBS) and samples listed above
Matrix Spike: MY2M84S
Duplicate: MY2M84D
ICP Serial Dilution: MY2M84L

Analysis: CLP Total Metals

<u>Analyte</u>	<u>Sample Preparation and Digestion Date</u>	<u>Analysis Date</u>
ICP-AES Metals	July 7, 2006	July 11 and 14, 2006
Mercury	July 11, 2006	July 11, 2006
Percent Solids	July 7, 2006	July 10, 2006

CLP PO Action

None.

Sampling Issues

1. The samples were shipped in a cardboard box without a temperature indicator bottle or ice and arrived at the laboratory with a temperature of 25.5°C. Since the mercury samples arrived at a temperature greater than both the 4°±2 °C SOW limit and the 20.0°C Region 9 maximum temperature limit, results for mercury are estimated “J” or “UJ”.
2. The Traffic Report/Chain of Custody (TR/COC) record form did not specify a sample to be used for laboratory quality control (QC). The laboratory selected sample MY2M84 for QC analysis. The effect on data quality is not known.

Additional Comments

Several Form 12s in the data package require correction. The corrected forms were requested from the laboratory but have not been received to date. Data quality is not likely to be affected and this report is considered final. (See attached communication record log.)

Results for sample MY2 JJ7, the field duplicate of sample MY2M80, are included in Case 35429 SDG MY2JJ5.

Results for sample MY2MA4, the field duplicate of sample MY2M88, are included in Case 35429 SDG MY2MA3.

The results for several analytes in the background samples exceed the respective contract required quantitation limits (CRQLs). Refer to Table 1A for background sample results.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- ▼ Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration ILM05.3, March 2004; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	No	B
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	No	C
8.	Matrix Spike Sample Analysis	No	D
9.	ICP Serial Dilution Analysis	Yes	
10.	Field Duplicate Sample Analysis	No	E
11.	Sample Quantitation	Yes	A
12.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

- A. Results above the method detection limit (MDL) but below the CRQL (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

- B. The following results are estimated and flagged "J" or "UJ" in Table 1A due to inadequate sample preservation.

▼ Mercury in all samples

The samples arrived at the laboratory at a temperature of 25.5°C. Samples did not meet either the 4°±2 °C SOW temperature criterion or the 20.0°C Region 9 maximum temperature criterion. Sample results for mercury may be biased low and, where non-detected, false negatives may exist.

- C. The following results are estimated and flagged "J" in Table 1A because of a laboratory duplicate result outside method QC limits.

▼ Calcium in all samples

Laboratory duplicate results for sample MY2M84D do not meet ▼35 relative percent difference (RPD) criterion for precision as listed below.

Analyte	Laboratory Duplicate, RPD
Calcium	69

Results for calcium in all samples are considered quantitatively uncertain.

Duplicate analyses demonstrate the analytical precision obtained for each sample matrix. The imprecision between duplicate results may be due to sample non-homogeneity, or poor laboratory technique.

- D. The following results are estimated and flagged "J" or "UJ" in Table 1A because matrix spike recovery results are outside method QC limits.

- ▼ Antimony in all samples
- ▼ Arsenic in all samples

Matrix spike recovery results for antimony and arsenic in QC sample MY2M84S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for the analytes are presented below and are based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	50	-50
Arsenic	61	-39

Results above the MDL are considered quantitatively uncertain. Results reported for antimony and arsenic in the samples listed above may be biased low.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes fall outside the 75-125% control limits, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery results for sample MY2M84A were obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	90
Arsenic	98

Since the post-digestion spike recoveries were acceptable, the low pre-digestion spike recovery results obtained for antimony and arsenic may indicate sample non-homogeneity, poor laboratory technique or matrix effects which may interfere with accurate analysis, depressing the analytical result.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

- E. The following relative percent differences (RPDs) or absolute differences were obtained for field duplicate pairs listed below.

	MY2M80 D1 MY2JJ7 D1	MY2M88 D2 MY2MA4 D2
Analyte	Result	Result
Aluminum	52 RPD	--
Barium	--	81 RPD
Calcium	101 RPD	--
Chromium	51 RPD	--
Copper	81 RPD	--
Iron	49 RPD	--
Lead	4.4 mg/kg difference	--
Magnesium	1,200 mg/kg difference	--
Manganese	74 RPD	--
Zinc	42.5 mg/kg difference	--

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ▼35 RPD or ▼2 times CRQL absolute difference criteria for precision. The effect on the quality of the data is not known.

In addition, mercury was detected in the field duplicate sample MY2MA4 at a concentration of 0.47 mg/kg, but was not detected in the associated field duplicate sample MY2M88. An RPD is not calculated. The effect on data quality is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, high levels of solids in the sample, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

In Reference to
Case: 35429 SDG No.: MY2M69

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM

Communication Record Log

Date of Contact: September 21, 2006

Laboratory Name: Bonner Analytical Testing Co. (BONNER)

Lab Contact: Christopher Bonner

Region: 9

Regional Contact: Steve Remaley, CLP PO

ESAT Reviewer: Stan Kott, ESAT/LDC

Call Initiated By: Laboratory X Region

In reference to data for the following sample(s): All

Summary of Questions/issues Discussed:

The following items were noted during the review of this sample delivery group (SDG) data package. Please respond within 4 days as specified in ILM05.3 Statement of Work (SOW), Exhibit B, Section 2, 2.2. Send response and resubmissions to

ICF Consulting, Inc./Laboratory Data Consultants, Inc.
Environmental Services Assistance Team, USEPA Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804, FAX 510 412-2304.

1. The mercury samples of this SDG shown as prepared by method CS1 on page 201 are not listed on Form 12 (Preparation Log) page 76. However, these samples are listed on page 74 as being prepared by method HS1. Please review the data and provide the corrected forms.

Summary of Resolution: To be determined.

Regional Contact Signature

Date of Resolution

ANALYTICAL RESULTS

Page 1 of 4

Case No. : 35429

SDG No. : MY2M69

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 22, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment

Samples for Total Metals

Station Location : Sample ID : Collection Date :				SDM24-210606-1324 MY2MA2 6/21/2006			SDF1-230606-1415 MY2M69 6/23/2006			SDF7-280606-1505 MY2M70 6/28/2006			SDF8-280606-1515 MY2M71 6/28/2006			SDF9-280606-1700 MY2M72 6/28/2006		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	3520			5360			19600			14300			13200			47000		
ANTIMONY	7.8U	J	D	8.0U	J	D	10.5U	J	D	11.4U	J	D	9.7U	J	D	2.2L	J	AD
ARSENIC	2.1	J	D	3.5	J	D	11.9	J	D	6.6	J	D	5.5	J	D	7.4	J	D
BARIUM	47.9			90.7			195			705			2970			2480		
BERYLLIUM	0.18L	J	A	0.27L	J	A	1.2			2.3			7.6			10.3		
CADMIUM	0.32L	J	A	0.48L	J	A	0.67L	J	A	1.8			1.2			2.9		
CALCIUM	10600	J	C	11300	J	C	5910	J	C	176000	J	C	69100	J	C	44800	J	C
CHROMIUM	8.5			11.8			32.6			27.4			24.8			108		
COBALT	2.4L	J	A	3.7L	J	A	11.7			9.1L	J	A	9.5			11.9		
COPPER	3.7			4.9			41.8			61.3			67.1			854		
IRON	7840			11900			39400			24400			19500			27000		
LEAD	3.1			4.9			14.0			92.6			16.5			139		
MAGNESIUM	3180			4300			13100			24900			22000			52400		
MANGANESE	115			180			323			1070			1040			1450		
MERCURY	0.13U	J	B	0.13U	J	B	0.079L	J	AB	0.092L	J	AB	0.16U	J	B	0.043L	J	AB
NICKEL	8.8			10.7			36.6			24.7			22.0			73.4		
POTASSIUM	1370			2000			8440			6860			4630			5680		
SELENIUM	4.6U			4.6U			6.1U			6.6U			5.7U			5.0U		
SILVER	1.3U			1.3U			1.8U			1.9U			1.6U			1.4U		
SODIUM	4080			5460			11500			11900			7750			1720		
THALLIUM	3.3U			3.3U			1.7L	J	A	1.2L	J	A	4.1U			1.2L	J	A
VANADIUM	13.1			19.0			59.8			45.9			38.8			59.6		
ZINC	21.9			31.7			119			257			212			1450		
Percent Solids	76.8%			75.3%			57.1%			52.8%			61.7%			70.3%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : MY2M69

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 22, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment

Samples for Total Metals

Station Location :	SDF10-290606-0800			SDF14-280606-1605			SDF15-280606-1610			SDF16-280606-1620			SDF101-230606-1600			SDM1-200606-1045		
Sample ID :	MY2M73			MY2M77 BG			MY2M78 BG			MY2M79 BG			MY2M80 D1			MY2M81 BG		
Collection Date :	6/29/2006			6/28/2006			6/28/2006			6/28/2006			6/23/2006			6/20/2006		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	7670			3100			1750			8580			3660		E	8120		
ANTIMONY	8.4U	J	D	8.3U	J	D	7.6U	J	D	8.4U	J	D	8.6U	J	D	7.8U	J	D
ARSENIC	2.0	J	D	1.6	J	D	0.54L	J	AD	9.2	J	D	1.6	J	D	7.2	J	D
BARIUM	465			50.1			26.7			147			52.1			332		
BERYLLIUM	1.7			0.20L	J	A	0.11L	J		0.51L	J	A	0.27L	J	A	0.46L	J	A
CADMIUM	0.51L	J	A	0.71			0.36L	J		0.98			0.27L	J	A	0.15L	J	A
CALCIUM	29800	J	C	64100	J	C	14300	J	C	42800	J	C	26500	J	CE	21700	J	C
CHROMIUM	28.1			7.3			3.2			16.2			10.3		E	18.9		
COBALT	3.4L	J	A	2.8L	J	A	1.8L	J	A	7.1			2.5L	J	A	6.4L	J	A
COPPER	144			18.0			6.8			30.2			36.5		E	9.2		
IRON	8400			6400			4000			19200			6790		E	18800		
LEAD	49.4			10.6			3.2			23.2			7.8		E	8.2		
MAGNESIUM	6610			3420			1820			6680			2600		E	6510		
MANGANESE	337			282			126			555			149		E	274		
MERCURY	0.14U	J	B	0.14U	J	B	0.13U	J	B	0.14U	J	B	0.14U	J	B	0.13U	J	B
NICKEL	21.5			7.9			4.5L	J	A	18.4			8.0			16.3		
POTASSIUM	1190			1520			646			3200			1010			3150		
SELENIUM	4.9U			4.9U			4.4U			4.9U			5.0U			4.6U		
SILVER	1.4U			1.4U			1.3U			1.4U			1.4U			1.3U		
SODIUM	936			6370			2540			1230			1770			8920		
THALLIUM	3.5U			3.5U			3.1U			1.0L	J	A	3.6U			3.3U		
VANADIUM	14.8			11.6			6.5			31.0			11.5			34.9		
ZINC	254			136			136			119			71.3		E	49.4		
Percent Solids	71.1%			71.9%			79.4%			71.5%			69.6%			76.8%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : MY2M69

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 22, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment

Samples for Total Metals

Station Location : Sample ID : Collection Date :	SDM2-200606-1112 MY2M82 BG 6/20/2006			SDM3-200606-1149 MY2M83 BG 6/20/2006			SDM4-200606-1400 MY2M84 BG 6/20/2006			SDM5-200606-1615 MY2M85 BG 6/20/2006			SDM6-200606-1626 MY2M86 BG 6/20/2006			SDM14-210606-1036 MY2M87 6/21/2006		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	4020			3440			4300			5440			5440			4350		
ANTIMONY	7.8U	J	D	7.9U	J	D	7.7U	J	D	7.8U	J	D	7.9U	J	D	7.9U	J	D
ARSENIC	3.6	J	D	2.7	J	D	6.1	J	D	5.0	J	D	3.5	J	D	2.5	J	D
BARIUM	106			79.3			136			85.9			200			137		
BERYLLIUM	0.24L	J	A	0.20L	J	A	0.26L	J	A	0.31L	J	A	0.28L	J	A	0.23L	J	A
CADMIUM	0.65U			0.66U			0.040L	J	A	0.12L	J	A	0.42L	J	A	0.31L	J	A
CALCIUM	9020	J	C	8200	J	C	10300	J	C	10100	J	C	12300	J	C	9380	J	C
CHROMIUM	9.3			8.1			10.1			11.7			11.7			10.0		
COBALT	3.3L	J	A	2.7L	J	A	4.0L	J	A	4.4L	J	A	3.7L	J	A	3.3L	J	A
COPPER	4.3			3.8			5.6			5.9			5.0			4.0		
IRON	9610			7900			13000			12500			12300			10300		
LEAD	3.3			2.8			3.8			4.9			5.4			4.9		
MAGNESIUM	3310			2880			3480			4430			4210			3470		
MANGANESE	132			119			148			185			185			149		
MERCURY	0.13U	J	B	0.13U	J	B	0.13U	J	B	0.13U	J	B	0.13U	J	B	0.13U	J	B
NICKEL	8.2			7.6			9.8			11.4			10.4			8.7		
POTASSIUM	1600			1340			1680			2120			1890			1600		
SELENIUM	4.6U			4.6U			4.5U			4.6U			4.6U			4.6U		
SILVER	1.3U			1.3U			1.3U			1.3U			1.3U			1.3U		
SODIUM	4050			3980			4320			5620			4810			4490		
THALLIUM	3.3U			3.3U			3.2U			3.3U			3.3U			3.3U		
VANADIUM	16.8			13.6			21.2			20.9			21.0			17.3		
ZINC	24.9			21.0			27.2			34.4			30.9			25.4		
Percent Solids	76.5%			75.6%			77.7%			76.7%			76.4%			76.4%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : MY2M69

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 22, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment

Samples for Total Metals

Station Location : Sample ID : Collection Date :	SDM16-210606-1054 MY2M88 D2 6/21/2006			SDM21-210606-1151 MY2M89 6/21/2006			MDL			CRQL								
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	4340			4120			0.18			20.0								
ANTIMONY	7.9U	J	D	7.7U	J	D	0.72			6.0								
ARSENIC	3.4	J	D	2.2	J	D	0.25			1.0								
BARIUM	81.1		E	46.1			0.05			20.0								
BERYLLIUM	0.23L	J	A	0.21L	J	A	0.004			0.50								
CADMIUM	0.30L	J	A	0.30L	J	A	0.02			0.50								
CALCIUM	11800	J	C	9020	J	C	3.5			500								
CHROMIUM	9.4			10.1			0.13			1.0								
COBALT	3.2L	J	A	2.9L	J	A	0.04			5.0								
COPPER	4.2			3.9			0.11			2.5								
IRON	10200			9040			0.53			10.0								
LEAD	4.1			3.5			0.31			1.0								
MAGNESIUM	3490			3410			0.31			500								
MANGANESE	139			134			0.02			1.5								
MERCURY	0.13U	J	BE	0.13U	J	B	0.03			0.10								
NICKEL	8.3			9.6			0.09			4.0								
POTASSIUM	1710			1550			0.55			500								
SELENIUM	4.6U			4.5U			0.97			3.5								
SILVER	1.3U			1.3U			0.08			1.0								
SODIUM	4230			3990			10.9			500								
THALLIUM	3.3U			3.2U			0.56			2.5								
VANADIUM	17.2			14.6			0.08			5.0								
ZINC	25.7			24.4			0.18			6.0								
Percent Solids	76.3%			77.6%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

**Appendix H-4:
CLP Sediment Metals**



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes & Site Assessment Section, SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: September 7, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	MY2MA3
Laboratory:	Bonner Analytical Testing Company (BONNER)
Analysis:	CLP Total Metals
Samples:	16 Sediment and 4 Soil Samples (see Case Summary)
Collection Date:	June 21, 22, 27, and 28, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☒ FYI ☐ Action

SAMPLING ISSUES: ☒ Yes ☐ No

Data Validation Report

Case No.: 35429
SDG No.: MY2MA3
Site: Halaco
Laboratory: Bonner Analytical Testing Company (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: September 7, 2006

I. CASE SUMMARY

Sample Information

Sediment Samples: MY2MA3 through MY2MA9 and MY2MB0 through MY2MB8
Soil Samples: MY2MB9, MY2MC0, MY2MC1, and MY2MC2
Concentration and Matrix: Low Concentration Sediment and Soil
Analysis: CLP Total Metals
SOW: ILM05.3
Collection Date: June 21, 22, 27, and 28, 2006
Sample Receipt Date: July 1, 2006
Preparation Date: July 7 and 10, 2006
Analysis Date: July 10 and 11, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Background Samples (BG): MY2MB1 through MY2MB6
Field Duplicates (D1): MY2MA4 and MY2M88 (See Additional Comments)
Field Duplicates (D2): MY2MA7 and MY2MB8
Field Duplicates (D3): MY2MA8 and MY2MB7
Field Duplicates (D4): MY2MB9 and MY2JL8 (See Additional Comments)
Field Duplicates (D5): MY2MC0 and MY2MC2

Laboratory QC

Method Blanks & Associated Samples: Preparation Blank- Soil (PBS) and samples listed above

Matrix Spike: MY2MA5S
Duplicate: MY2MA5D
ICP Serial Dilution: MY2MA5L

Analysis: CLP Total Metals

<u>Analyte</u>	<u>Sample Preparation and Digestion Date</u>	<u>Analysis Date</u>
ICP-AES Metals	July 7, 2006	July 11, 2006
Mercury	July 10, 2006	July 10, 2006
Percent Solids	July 7, 2006	July 10, 2006

CLP PO Action

None.

Sampling Issues

1. The samples were shipped in a cardboard box without a temperature indicator bottle or ice and arrived at the laboratory with a temperature of 25.5°C. Since the mercury samples arrived at a temperature greater than both the 4°±2 °C SOW limit and the 20.0°C Region 9 maximum temperature limit, results for mercury are estimated “J” or “UJ”.
2. The Traffic Report/Chain of Custody (TR/COC) record form did not specify a sample to be used for laboratory quality control (QC). The laboratory selected sample MY2MA5 for QC analysis. The effect on data quality is not known.

Additional Comments

Results for sample MY2M88, the field duplicate of sample MY2MA4, are included in Case 35429 SDG MY2M69.

Results for sample MY2JL8, the field duplicate of sample MY2MB9, are included in Case 35429 SDG MY2JJ5.

The results for several analytes in background samples MY2MB1 through MY2MB6 exceed the respective contract required quantitation limits (CRQLs). Refer to Table 1A for background sample results.

Sample MY2MB9 was analyzed at a 3-fold dilution for manganese, potassium, sodium, and zinc and a 5-fold dilution for aluminum due to analyte concentrations that exceed the instrument's linear range. No adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- ▼ Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration ILM05.3, March 2004; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	No	B
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	C
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	D
9.	ICP Serial Dilution Analysis	No	E
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	F
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

- A. Results above the MDL but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

- B. The following results are estimated and flagged "J" or "UJ" in Table 1A due to inadequate sample preservation.

- ▼ Mercury in all samples

The samples arrived at the laboratory at a temperature of 25.5°C. Samples did not meet either the 4°±2 °C SOW temperature criterion or the 20.0°C Region 9 maximum temperature criterion. Sample results for mercury may be biased low and, where non-detected, false negatives may exist.

- C. The following results are reported as non-detected (U) in Table 1A due to low level preparation blank and continuing calibration blank (CCB) contamination.

- ▼ Antimony in samples MY2MB2 and MY2MC1
- ▼ Beryllium in samples MY2MA7 through MY2MA9, MY2MB0 through MY2MB8, and MY2MC0 through MY2MC2
- ▼ Sodium in sample MY2MC1

The sodium value (28.6 mg/kg) in preparation blank PBS is greater than the MDL but less than the CRQL. The concentrations for antimony (0.73 mg/kg) and beryllium (0.0057 mg/kg) in CCB3 are greater than the respective MDLs but less than their respective CRQLs. Sample results greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the CRQL.

A preparation blank is an analytical control that contains distilled, deionized water, or baked sand for solid matrices, and reagents, which is carried through the entire analytical procedure. The preparation blank is used to determine the level of contamination introduced by the laboratory during preparation and analysis.

A continuing calibration blank (CCB) consists of deionized distilled water and reagents. It is analyzed after the continuing calibration verification (CCV) standard, at a frequency of every 10 samples and at the end of the analytical run to monitor analyte carry-over.

- D. The following results are estimated and flagged "J" or "UJ" in Table 1A because matrix spike recovery results are outside method QC limits.

▼ Antimony in all samples

Matrix spike recovery results for antimony in QC sample MY2MA5S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for antimony is presented below and is based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Antimony	70	-30

Results above the MDL are considered quantitatively uncertain. Results reported for antimony in all samples may be biased low.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes fall outside the 75-125% control limits, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery result for sample MY2MA5A was obtained.

Analyte	Post-Digestion Spike, % Recovery
Antimony	95

Since the post-digestion spike recovery was acceptable, the low pre-digestion spike recovery result (70.0%) obtained for antimony may indicate sample non-homogeneity, poor laboratory technique or matrix effects which may interfere with accurate analysis, depressing the analytical result.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

- E. The following results are estimated and flagged "J" or "UJ" in Table 1A because ICP serial dilution results are outside method QC limits.

▼ Sodium and zinc in all samples

The percent difference for the ICP serial dilution analysis of sample MY2MA5L did not meet the 10% criterion for the analytes shown below.

Analyte	% Difference
Sodium	+12
Zinc	+42

Results reported for sodium and zinc in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The result for the diluted sample was higher than the original. Therefore, the reported sample result may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

- F. The following relative percent differences (RPDs) or absolute differences were obtained for field duplicate pairs listed below.

	MY2MA4 D1 MY2M88 D1	MY2MA7 D2 MY2MB8 D2
Analyte	Result	Result
Aluminum	--	43 RPD
Arsenic	--	2.5 mg/kg difference
Barium	81 RPD	56 RPD
Calcium	--	48 RPD
Iron	--	50 RPD
Lead	--	65 RPD
Manganese	--	43 RPD
Vanadium	--	13.2 mg/kg difference

	MY2MA8 D3 MY2MB7 D3	MY2MB9 D4 MY2JL8 D4	MY2MC0 D5 MY2MC2 D5
Analyte	Result	Result	Result
Arsenic	--	--	2.1 mg/kg, difference
Mercury	0.28 mg/kg, difference	--	--
Vanadium	--	36	--

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ▼35 RPD or ▼2 times CRQL absolute difference criteria for precision. The effect on the quality of the data is not known.

In addition, mercury was detected in the field duplicate sample MY2MA4 at a concentration of 0.47 mg/kg, but was not detected in the associated field duplicate sample MY2M88. Mercury was also detected in the field duplicate sample MY2MA7 at a concentration of 0.21 mg/kg, but was not detected in the associated field duplicate sample MY2MB8. An RPD is not calculated. The effect on data quality is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, high levels of solids in the sample, or poor sampling or laboratory technique.

TABLE 1B
DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

- | | |
|----|---|
| U | The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit. |
| J | The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. |
| J+ | The result is an estimated quantity, but the result may be biased high. |
| J- | The result is an estimated quantity, but the result may be biased low. |
| R | The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample. |
| UJ | The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise. |

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : MY2MA3

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 7, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SDM26-210606-1346			SDM100-210606-1330			SDB17-270606-1425			SDB18-270606-1430			SDB20-270606-1439			SDB23-270606-1451		
Sample ID :	MY2MA3			MY2MA4 D1			MY2MA5			MY2MA6			MY2MA7 D2			MY2MA8 D3		
Collection Date :	6/21/2006			6/21/2006			6/27/2006			6/27/2006			6/27/2006			6/27/2006		
Matrix :	Sediment			Sediment			Sediment			Sediment			Sediment			Sediment		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	3350			4580			2160			2510			2200		F	1820		
ANTIMONY	7.6U	J	D	7.9U	J	D	6.2U	J	D	6.2U	J	D	6.2U	J	D	6.2U	J	D
ARSENIC	3.0			4.6			4.0			4.6			4.8		F	3.4		
BARIUM	154			191		F	246			278			297		F	253		
BERYLLIUM	0.20L	J	A	0.27L	J	A	0.20L	J	A	0.23L	J	A	0.52U		C	0.52U		C
CADMIUM	0.64U			0.66U			0.17L	J	A	0.21L	J	A	0.46L	J	A	0.050L	J	A
CALCIUM	8630			11700			14300			15700			14400		F	12300		
CHROMIUM	7.8			10.3			10.7			12.9			18.3			10.0		
COBALT	2.6L	J	A	3.6L	J	A	2.2L	J	A	2.8L	J	A	2.7L	J	A	2.3L	J	A
COPPER	3.8			4.5			3.4			3.5			3.6			3.1		
IRON	7850			10800			8120			9740			9640		F	9010		
LEAD	2.5			4.0			4.6			5.1			5.4		F	4.4		
MAGNESIUM	2680			3470			1830			2000			1760			1730		
MANGANESE	114			153			109			120			112		F	91.5		
MERCURY	0.42	J	B	0.47	J	BF	0.25	J	B	0.21	J	B	0.21	J	BF	0.34	J	BF
NICKEL	7.1			8.4			5.5			6.6			6.2			5.1		
POTASSIUM	1120			1660			479L	J	A	571			495L	J	A	434L	J	A
SELENIUM	4.5U			4.6U			3.6U			3.6U			3.6U			3.6U		
SILVER	1.3U			1.3U			1.0U			1.0U			1.0U			1.0U		
SODIUM	3580	J	E	4820	J	E	625	J	E	789	J	E	733	J	E	643	J	E
THALLIUM	3.2U			3.3U			2.6U			2.6U			2.6U			2.6U		
VANADIUM	14.1			19.4			14.3			17.1			17.8		F	19.4		
ZINC	19.5	J	E	25.5	J	E	13.2	J	E	15.8	J	E	14.8	J	E	11.5	J	E
Percent Solids	78.5%			75.6%			96.6%			97.2%			96.3%			96.6%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : MY2MA3

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 7, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SDB26-270606-1502			SDB30-270606-1512			SDB31-270606-0809			SDB32-270606-0816			SDB33-270606-0822			SDB34-270606-0830		
Sample ID :	MY2MA9			MY2MB0			MY2MB1 BG			MY2MB2 BG			MY2MB3 BG			MY2MB4 BG		
Collection Date :	6/27/2006			6/27/2006			6/27/2006			6/27/2006			6/27/2006			6/27/2006		
Matrix :	Sediment			Sediment			Sediment			Sediment			Sediment			Sediment		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	1750			1770			1760			1410			1350			1500		
ANTIMONY	6.2U	J	D	6.2U	J	D	6.2U	J	D	6.2U	J	CD	6.2U	J	D	6.2U	J	D
ARSENIC	2.9			2.0			2.5			2.1			1.1			1.3		
BARIUM	200			81.9			33.7			51.1			26.9			28.1		
BERYLLIUM	0.52U		C	0.52U		C	0.51U		C	0.51U		C	0.52U		C	0.52U		C
CADMIUM	0.040L	J	A	0.52U			0.51U			0.51U			0.51U			0.52U		
CALCIUM	9320			7470			5600			4970			4410			6330		
CHROMIUM	9.1			5.7			3.5			4.9			4.2			4.0		
COBALT	1.9L	J	A	1.6L	J	A	1.4L	J	A	1.2L	J	A	1.1L	J	A	1.2L	J	A
COPPER	2.9			2.5L	J	A	2.4L	J	A	1.9L	J	A	1.7L	J	A	2.0L	J	A
IRON	7570			5170			4630			3990			3430			3850		
LEAD	3.4			2.5			1.8			1.6			1.2			1.3		
MAGNESIUM	1460			1420			1420			1140			1150			1380		
MANGANESE	88.3			74.6			70.1			57.3			49.5			64.7		
MERCURY	0.16	J	B	0.075L	J	AB	0.052L	J	AB	0.10U	J	B	0.10U	J	B	0.064L	J	AB
NICKEL	4.7			4.4			4.0L	J	A	3.4L	J	A	3.4L	J	A	3.6L	J	A
POTASSIUM	443L	J	A	470L	J	A	486L	J	A	391L	J	A	375L	J	A	416L	J	A
SELENIUM	3.6U			3.6U			3.6U			3.6U			3.6U			3.6U		
SILVER	1.0U			1.0U			1.0U			1.0U			1.0U			1.0U		
SODIUM	682	J	E	722	J	E	681	J	E	514	J	E	553	J	E	601	J	E
THALLIUM	2.6U			2.6U			2.6U			2.6U			2.6U			2.6U		
VANADIUM	13.0			7.7			6.4			5.9			5.1L	J	A	5.7		
ZINC	11.4	J	E	10.4	J	E	10.5	J	E	8.2	J	E	7.8	J	E	8.7	J	E
Percent Solids	96.8%			96.1%			97.3%			97.3%			97.1%			96.7%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : MY2MA3

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 7, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SDB35-270606-0840			SDB36-270606-0845			SDB100-280606-1400			SDB101-270606-1500			SSN102-220606-0841			SSR6-270606-1649		
Sample ID :	MY2MB5 BG			MY2MB6 BG			MY2MB7 D3			MY2MB8 D2			MY2MB9 D4			MY2MC0 D5		
Collection Date :	6/27/2006			6/27/2006			6/28/2006			6/27/2006			6/22/2006			6/27/2006		
Matrix :	Sediment			Sediment			Sediment			Sediment			Soil			Soil		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	1630			1500			2160			3390		F	139000			11600		
ANTIMONY	6.2U	J	D	6.2U	J	D	6.2U	J	D	6.3U	J	D	9.4	J	D	8.1U	J	D
ARSENIC	1.9			2.1			4.0			7.3		F	6.0			4.9		F
BARIUM	57.2			41.2			327			530		F	2720			179		
BERYLLIUM	0.52U		C	0.52U		C	0.52U		C	0.52U		C	16.5			0.68U		C
CADMIUM	0.52U			0.52U			0.050L	J	A	0.25L	J	A	4.5			0.78		
CALCIUM	5860			4900			13600			23600		F	10900			11900		
CHROMIUM	4.6			3.4			13.0			25.9			449			19.1		
COBALT	1.3L	J	A	1.2L	J	A	2.7L	J	A	4.1L	J	A	10.8			8.7		
COPPER	2.3L	J	A	2.0L	J	A	3.7			5.6			5040			27.9		
IRON	4540			3880			10700			16100		F	14600			22100		
LEAD	1.8			1.6			6.0			10.6		F	341			17.7		
MAGNESIUM	1340			1180			1690			2620			64000			6770		
MANGANESE	66.0			59.3			124			173		F	3700			359		
MERCURY	0.098L	J	AB	0.080L	J	AB	0.065L	J	ABF	0.10U	J	BF	0.095L	J	AB	0.092L	J	AB
NICKEL	4.1L	J	A	3.7L	J	A	6.1			9.4			283			21.2		
POTASSIUM	448L			430L	J	A	507L	J	A	770			23700			3720		
SELENIUM	3.6U			3.6U			3.6U			3.7U			4.5U			4.7U		
SILVER	1.0U			1.0U			1.0U			1.0U			1.3U			1.4U		
SODIUM	645	J	E	671	J	E	790	J	E	1460	J	E	33100	J	E	461L	J	AE
THALLIUM	2.6U			2.6U			2.6U			2.6U			2.9L	J	A	1.3L	J	A
VANADIUM	6.6			7.1			18.7			31.0		F	64.6		F	39.6		
ZINC	10.1	J	E	8.9	J	E	15.5	J	E	21.8	J	E	5330	J	E	82.5	J	E
Percent Solids	96.9%			96.5%			96.5%			95.3%			78.1%			73.7%		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : MY2MA3

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : September 7, 2006

QUALIFIED DATA

Concentration in mg/kg (Dry Weight)

Analysis Type : Low Concentration Sediment and
Soil Samples for CLP Total Metals

Station Location :	SSR8-270606-1702			SSR11-270606-1215			MDL			CRQL								
Sample ID :	MY2MC1			MY2MC2 D5														
Collection Date :	6/27/2006			6/27/2006														
Matrix :	Soil			Soil														
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	4320			8520			0.18			20.0								
ANTIMONY	6.0U	J	CD	8.2U	J	D	0.72			6.0								
ARSENIC	2.5			2.8		F	0.25			1.0								
BARIUM	93.5			126			0.05			20.0								
BERYLLIUM	0.50U		C	0.68U		C	0.004			0.50								
CADMIUM	0.50			0.51L	J	A	0.020			0.50								
CALCIUM	6590			8990			3.5			500								
CHROMIUM	8.7			13.9			0.13			1.0								
COBALT	3.5L	J	A	6.2L	J	A	0.04			5.0								
COPPER	13.6			25.2			0.11			2.5								
IRON	9620			15700			0.53			10.0								
LEAD	47.8			18.7			0.31			1.0								
MAGNESIUM	2540			4900			0.31			500								
MANGANESE	179			270			0.02			1.5								
MERCURY	0.076L	J	AB	0.062L	J	AB	0.040			0.10								
NICKEL	10.9			15.5			0.09			4.0								
POTASSIUM	1420			2770			0.55			500								
SELENIUM	3.5U			4.8U			0.97			3.5								
SILVER	1.0U			1.4U			0.08			1.0								
SODIUM	504U	J	CE	434L	J	AE	10.9			500								
THALLIUM	2.5U			3.4U			0.56			2.5								
VANADIUM	16.8			28.9			0.08			5.0								
ZINC	66.5	J	E	68.5	J	E	0.18			6.0								
Percent Solids	99.2%			73.6%			N/A			N/A								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

Appendix H-5: CLP Water Metals



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes & Site Assessment Section, SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: August 29, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	MY2M54
Laboratory:	Bonner Analytical Testing Company (BONNER)
Analysis:	CLP Total Metals By ICP-AES
Samples:	15 Groundwater and 5 Surface Water Samples (see Case Summary)
Collection Date:	June 27, 28, and 29, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☐ FYI ☒ Action

SAMPLING ISSUES: ☒ Yes ☐ No

Data Validation Report

Case No.: 35429
SDG No.: MY2M54
Site: Halaco
Laboratory: Bonner Analytical Testing Company (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: August 29, 2006

I. CASE SUMMARY

Sample Information

Groundwater Samples: MY2M54 through MY2M68
Surface Water Samples: MY2M90 through MY2M94
Concentration and Matrix: Low Concentration Water
Analysis: CLP Total Metals By ICP-AES
SOW: ILM05.3
Collection Date: June 27, 28, and 29, 2006
Sample Receipt Date: July 1, 2006
Preparation Date: July 6 and 7, 2006
Analysis Date: July 7 and 10, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Background Samples (BG): MY2M58 and MY2M67
Field Duplicates (D1): MY2M60 and MY2M64
Field Duplicates (D2): MY2M92 and MY2MA0 (See Additional Comments)

Laboratory QC

Method Blanks & Associated Samples: Preparation Blank- Water (PBW) and samples listed above
Matrix Spike: MY2M54S
Duplicates: MY2M54D
ICP Serial Dilution: MY2M54L

Analysis: CLP Total Metals By ICP-AES

<u>Analyte</u>	<u>Sample Preparation and Digestion Date</u>	<u>Analysis Date</u>
ICP-AES Metals	July 6, 2006	July 7 and 10, 2006
Mercury	July 7, 2006	July 7, 2006
Percent Solids	Not Applicable	Not Applicable

CLP PO Action

1. Non-detected results reported for antimony, lead, selenium, silver, and thallium in sample MY2M60 and non-detected results reported for antimony, selenium, thallium, and vanadium in sample MY2M62 are rejected (R) and considered unacceptable since the pH of the aqueous samples were greater than 2 at the time of sample receipt.

2. Non-detected results reported for arsenic, selenium, thallium, and vanadium in sample MY2M61 are rejected (R) and considered unacceptable since the pH of the aqueous sample could not be confirmed by the laboratory due to an interfering reaction that rendered the pH strip black.

Sampling Issues

1. The Traffic Report/Chain of Custody (TR/COC) record form did not specify a sample to be used for laboratory quality control (QC). The laboratory selected sample MY2M54 for QC analysis. The effect on data quality is not known.
2. The cooler containing samples MY2M54, MY2M58, MY2M59, MY2M63, MY2M64, MY2M66, MY2M67, and MY2M68 arrived at the laboratory with a temperature of 14°C. The cooler containing samples MY2M55, MY2M56, MY2M57, MY2M65, MY2M90, and MY2M93 arrived at the laboratory with a temperature of 11°C. This temperature exceeds the temperature of $4^{\circ}\pm 2^{\circ}\text{C}$ specified in the Statement of Work (SOW). Since the water samples were preserved to a pH less than 2, no adverse effect on the quality of the data is expected.

Additional Comments

Results for sample MY2MA0, the field duplicate of sample MY2M92, are included in Case 35429 SDG MY2M95.

The results for several analytes in background samples MY2M58 and MY2M67 exceed the respective contract required quantitation limits (CRQLs). Refer to Table 1A for background sample results.

All samples were analyzed between 4 to 250-fold dilutions due to several analyte concentrations that exceed the instrument's linear range. No adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- ▼ Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration ILM05.3, March 2004; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	No	A,C
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	D
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	No	E
9.	ICP Serial Dilution Analysis	No	F
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	G
12.	Sample Quantitation	Yes	B
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

A. The following results are rejected and flagged "R" in Table 1A due to inadequate sample preservation.

- ▼ Antimony in samples MY2M60 and MY2M62
- ▼ Arsenic in sample MY2M61
- ▼ Lead in sample MY2M60
- ▼ Selenium and thallium in samples MY2M60, MY2M61, and MY2M62
- ▼ Silver in sample MY2M60
- ▼ Vanadium in sample MY2M61

These samples did not meet SOW sample preservation criterion. The samples were not adequately preserved in the field to a pH of less than 2 as shown below.

Sample Number	pH
MY2M60	4
MY2M61	Unknown
MY2M62	7

Note that the laboratory could not confirm the pH of sample MY2M61 due to an interfering reaction that rendered the pH strip black.

For non-detected sample results, false negatives may exist.

B. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

C. The following results are estimated and flagged "J" or "J-" in Table 1A due to inadequate sample preservation.

- ▼ All analytes in sample MY2M60 except antimony, lead, selenium, silver, and thallium
- ▼ All analytes in sample MY2M61 except arsenic, selenium, thallium, and vanadium
- ▼ All analytes in sample MY2M62 except antimony, selenium, and thallium

These samples did not meet SOW sample preservation criterion. The samples were not adequately preserved in the field to a pH of less than 2 as shown below.

Sample Number	pH
MY2M60	4
MY2M61	Unknown
MY2M62	7

Note that the laboratory could not confirm the pH of sample MY2M61 due to an interfering reaction that rendered the pH strip black.

Sample results may be biased low.

Note that sample results for antimony, arsenic, lead, selenium, silver, thallium, and vanadium in the respective samples listed above were previously rejected. Please refer to Comment A.

D. The following results are reported as non-detected (U) in Table 1A due to low level preparation blank and continuing calibration blank (CCB) contamination.

- ▼ Aluminum in samples MY2M91, MY2M93, and MY2M94
- ▼ Arsenic in samples MY2M65, MY2M68, MY2M90, and MY2M91
- ▼ Barium in samples MY2M57, MY2M59, MY2M66, MY2M67, MY2M90 through MY2M94
- ▼ Beryllium in samples MY2M64 through MY2M68, MY2M90, MY2M92, MY2M93, and MY2M94
- ▼ Cadmium in samples MY2M91 and MY2M92
- ▼ Nickel in samples MY2M91 through MY2M94
- ▼ Zinc in samples MY2M56, MY2M59, MY2M63, MY2M66, MY2M67, MY2M68, and MY2M90 through MY2M94

The concentration for zinc (2.4 µg/L) in preparation blank PBW is greater than the MDL but less than the CRQL. The values for aluminum (25.7µg/L in CCB6 and 33.0µg/L in CCB8), arsenic (25.7µg/L in CCB7), barium (2.1µg/L in CCB6 and 2.1µg/L in CCB8), beryllium (0.046µg/L in CCB7 and 0.063µg/L in CCB8), cadmium (0.35µg/L in CCB8), and nickel (0.92µg/L in CCB8) are greater than the respective MDLs but less than the respective CRQLs. Sample results greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the respective CRQL.

A preparation blank is an analytical control that contains distilled, deionized water, or baked sand for solid matrices, and reagents, which is carried through the entire analytical procedure. The preparation blank is used to determine the level of contamination introduced by the laboratory during preparation and analysis.

A continuing calibration blank (CCB) consists of deionized, distilled water and reagents. It is analyzed after the continuing calibration verification (CCV) standard, at a frequency of every 10 samples and at the end of the analytical run to monitor analyte carry-over.

- E. The following results are estimated and flagged "J" in Table 1A because a matrix spike recovery result is outside method QC limits.

- ▼ Silver in samples MY2M55, MY2M61, and MY2M62

Matrix spike recovery for silver in QC sample MY2M54S did not meet the 75-125% criteria for accuracy. The percent recovery and possible percent bias for silver is presented below and based on an ideal recovery of 100%.

Analyte	% Recovery	% Bias
Silver	262	+162

Results above the MDL are considered quantitatively uncertain. Results reported for silver in the samples listed above may be biased high.

According to the inorganic SOW, when the pre-digestion spike recovery results for ICP analytes (except silver) fall outside the control limits of 75-125%, a post-digestion spike must be performed for those elements that do not meet the specified criteria. The following post-digestion spike recovery result for sample MY2M54A was obtained.

Analyte	Post-Digestion Spike, % Recovery
Silver	61

Since both the post- and pre-digestion spikes did not meet the QC criteria, matrix effects may be present in the sample digestate which may interfere with accurate analysis.

The matrix spike sample analysis provides information about the effect of the sample matrix on the digestion and measurement methodology.

- F. The following results are estimated and flagged "J" or "UJ" in Table 1A because an ICP serial dilution result is outside method QC limits.

- ▼ Zinc in all samples

The percent difference for the ICP serial dilution analysis of sample MY2M54L did not meet the 10% criterion for zinc as shown below.

Analyte	% Difference
Zinc	+15

Results reported for zinc in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The result for the diluted sample was higher than the original. Therefore, the reported sample result may be biased low.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

- G. The following relative percent differences (RPDs) or absolute differences were obtained for field duplicate pairs listed below.

	MY2M60 D1 MY2M64 D1	MY2M92 D2 MY2MA0 D2
Analyte	RPD	RPD
Aluminum	49	379 µg/L difference
Arsenic	17.3 µg/L difference	--
Calcium	21	--
Copper	50	--
Iron	30	--
Manganese	--	58
Potassium	--	41
Zinc	72.0 µg/L difference	--

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ▼20 RPD or ▼CRQL criteria for precision. The effect on the quality of the data is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, high levels of solids in the sample, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

ANALYTICAL RESULTS

Page 1 of 4

Case No. : 35429 SDG No. : MY2M54
 Site : HALACO ENGINEERING
 Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
 Reviewer : Stan Kott, ESAT/LDC
 Date : August 29, 2006

Table 1A

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples
 For CLP Total Metals By ICP-AES

Station Location : MW11-280606-1647 Sample ID : MY2M54 Collection Date : 6/28/2006 Matrix : GW				MW12-280606-1550 MY2M55 6/28/2006 GW			MW1-270606-1810 MY2M56 6/27/2006 GW			MW13-280606-1738 MY2M57 6/28/2006 GW			MW14-280606-1500 MY2M58 BG 6/28/2006 GW			MW15-280606-1822 MY2M59 6/28/2006 GW		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	1010			1200			2380			671			9240			2660		
ANTIMONY	60.0U			60.0U			60.0U			60.0U			60.0U			60.0U		
ARSENIC	7.3L	J	B	7.1L	J	B	10.0U			10.0U			4.5L	J	B	10.0U		
BARIUM	110L	J	B	1570000			417			200U		D	249			200U		D
BERYLLIUM	0.15L	J	B	0.16L	J	B	0.20L	J	B	5.0U			0.57L	J	B	0.17L	J	B
CADMIUM	5.0U			10.3			5.0U			5.0U			5.0U			5.0U		
CALCIUM	498000			5730000			168000			111000			186000			158000		
CHROMIUM	10.0U			10.0U			3.1L	J	B	10.0U			13.7			3.7L	J	B
COBALT	1.9L	J	B	281			50.0U			50.0U			4.0L	J	B	1.2L	J	B
COPPER	59.3			147			9.3L	J	B	19.2L	J	B	82.3			3.6L	J	B
IRON	26800			692			4430			4310			16200			8130		
LEAD	61.8			10.0U			10.0U			35.9			18.8			10.0U		
MAGNESIUM	425000			2700000			191000			296000			179000			100000		
MANGANESE	1250			1150			567			465			1390			805		
MERCURY	0.20U			0.40U			0.20U			0.20U			0.031L	J	B	0.20U		
NICKEL	15.0L	J	B	6.7L	J	B	13.4L	J	B	5.4L	J	B	15.3L	J	B	3.9L	J	B
POTASSIUM	805000			21000000			1890000			855000			121000			71300		
SELENIUM	35.0U			35.0U			35.0U			35.0U			35.0U			35.0U		
SILVER	10.0U			8.4L	J	B	10.0U			10.0U			10.0U			10.0U		
SODIUM	1800000			15900000			1930000			1490000			1300000			460000		
THALLIUM	25.0U			25.0U			25.0U			25.0U			25.0U			25.0U		
VANADIUM	1.8L	J	B	2.6L	J	B	6.6L	J	B	1.3L	J	B	25.8L	J	B	7.8L	J	B
ZINC	318	J	F	95.2	J	F	60.0U	J	DF	70.1	J	F	245	J	F	60.0U	J	DF

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit N/A - Not Applicable NA - Not Analyzed

GW - Groundwater SW - Surface Water

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

Page 2 of 4

Case No. : 35429 SDG No. : MY2M54
 Site : HALACO ENGINEERING
 Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
 Reviewer : Stan Kott, ESAT/LDC
 Date : August 29, 2006

Table 1A

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples
 For CLP Total Metals By ICP-AES

Station Location : MW16-280606-0925				MW17-290606-1105			MW18-290606-0930			MW19-280606-1030			MW20-280606-0945			MW2A-280606-0758		
Sample ID : MY2M60 D1				MY2M61			MY2M62			MY2M63			MY2M64 D1			MY2M65		
Collection Date : 6/28/2006				6/29/2006			6/29/2006			6/28/2006			6/28/2006			6/28/2006		
Matrix : GW				GW			GW			GW			GW			GW		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	41800	J-	CG	12500	J	C	2920000	J-	C	1190			25400		G	1240		
ANTIMONY	60.0U	R	A	18.7L	J	BC	60.0U	R	A	60.0U			60.0U			9.2L	J	B
ARSENIC	40.8	J-	CG	10.0U	R	A	264	J-	C	5.5L	J	B	23.5		G	10.0U		D
BARIUM	570	J-	C	896	J	C	5030	J-	C	2020			420			665		
BERYLLIUM	1.7L	J-	BC	22.7	J	C	355	J-	C	0.12L	J	B	5.0U		D	5.0U		D
CADMIUM	0.95L	J-	BC	398	J	C	135	J-	C	5.0U			0.58L	J	B	0.92L	J	B
CALCIUM	1330000	J-	CG	1700000	J	C	2100000	J-	C	887000			1080000		G	1220000		
CHROMIUM	41.2	J-	C	159	J	C	3810	J-	C	10.0U			21.2			10.0U		
COBALT	11.1L	J-	BC	63.6	J	C	307	J-	C	50.0U			5.9L	J	B	1.6L	J	B
COPPER	148	J-	CG	8630	J	C	77700	J-	C	8.8L	J	B	88.5		G	73.4		
IRON	70500	J-	CG	117000	J	C	1040000	J-	C	1050			52200		G	1080		
LEAD	10.0U	R	A	4350	J	C	2790	J-	C	10.0U			10.0U			10.0U		
MAGNESIUM	524000	J-	C	1100000	J	C	4110000	J-	C	718000			503000			1470000		
MANGANESE	6610	J-	C	328000	J	C	98600	J-	C	2510			6050			4500		
MERCURY	0.059L	J-	BC	7.9	J	C	7.9	J-	C	0.20U			0.20U			0.20U		
NICKEL	31.7L	J-	BC	107	J	C	1610	J-	C	40.0U			18.4L	J	B	8.1L	J	B
POTASSIUM	6650000	J-	C	7760000	J	C	8410000	J-	C	8520000			6940000			8760000		
SELENIUM	35.0U	R	A	35.0U	R	A	35.0U	R	A	35.0U			35.0U			35.0U		
SILVER	10.0U	R	A	56.0	J	CE	571	J-	CE	10.0U			10.0U			10.0U		
SODIUM	3700000	J-	C	9020000	J	C	1600000	J-	C	1500000			14300000			12600000		
THALLIUM	25.0U	R	A	25.0U	R	A	25.0U	R	A	25.0U			25.0U			25.0U		
VANADIUM	92.2	J-	C	50.0U	R	A	1490	J-	C	2.1L	J	B	54.4			3.3L	J	B
ZINC	200	J-	CFG	90100	J	CF	51500	J-	CF	60.0U	J	DF	128	J	FG	63.5	J	F

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit N/A - Not Applicable NA - Not Analyzed

GW - Groundwater SW - Surface Water

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

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Case No. : 35429 SDG No. : MY2M54
 Site : HALACO ENGINEERING
 Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
 Reviewer : Stan Kott, ESAT/LDC
 Date : August 29, 2006

Table 1A

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples
 For CLP Total Metals By ICP-AES

Station Location : MW4-270606-1830 Sample ID : MY2M66 Collection Date : 6/27/2006 Matrix : GW				MW5-270606-1750 MY2M67 BG 6/27/2006 GW			MW6-270606-1735 MY2M68 6/27/2006 GW			WS1-270606-1245 MY2M90 6/27/2006 SW			WS2-270606-1440 MY2M91 6/27/2006 SW			WS3-280606-0952 MY2M92 D2 6/28/2006 SW		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	6200			1440			1710			417			200U		D	425		G
ANTIMONY	60.0U			60.0U			60.0U			60.0U			60.0U			60.0U		
ARSENIC	10.0U			10.0U			10.0U		D	10.0U		D	10.0U		D	10.0U		
BARIUM	200U		D	200U		D	5400			200U		D	200U		D	200U		D
BERYLLIUM	5.0U		D	5.0U		D	5.0U		D	5.0U		D	5.0U		D	5.0U		D
CADMIUM	5.0U			0.92L	J	B	0.59L	J	B	5.0U			5.0U		D	5.0U		D
CALCIUM	257000			233000			425000			273000			276000			301000		
CHROMIUM	0.73L	J	B	13.5			0.73L	J	B	10.0U			10.0U			10.0U		
COBALT	1.2L	J	B	50.0U			2.5L	J	B	50.0U			50.0U			50.0U		
COPPER	15.8L	J	B	43.4			19.1L	J	B	19.4L	J	B	45.3			67.1		
IRON	4560			945			1560			305			147			175		
LEAD	10.0U			10.0U			10.0U			10.0U			10.0U			10.0U		
MAGNESIUM	298000			385000			186000			148000			343000			314000		
MANGANESE	400			237			728			148			297			1100		G
MERCURY	0.20U			0.20U			0.20U			0.20U			0.20U			0.20U		
NICKEL	9.0L	J	B	6.0L	J	B	3.5L	J	B	4.9L	J	B	40.0U		D	40.0U		D
POTASSIUM	159000			973000			7980000			35800			434000			370000		G
SELENIUM	35.0U			35.0U			35.0U			35.0U			35.0U			35.0U		
SILVER	10.0U			10.0U			10.0U			10.0U			10.0U			10.0U		
SODIUM	1870000			2930000			9830000			704000			2700000			2360000		
THALLIUM	25.0U			25.0U			25.0U			25.0U			25.0U			25.0U		
VANADIUM	9.3L	J	B	3.3L	J	B	2.8L	J	B	1.8L	J	B	50.0U			50.0U		
ZINC	60.0U	J	DF	60.0U	J	DF	60.0U	J	DF	60.0U	J	DF	60.0U	J	DF	60.0U	J	DF

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit N/A - Not Applicable NA - Not Analyzed

GW - Groundwater SW - Surface Water

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

Page 4 of 4

Case No. : 35429 SDG No. : MY2M54
 Site : HALACO ENGINEERING
 Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
 Reviewer : Stan Kott, ESAT/LDC
 Date : August 29, 2006

Table 1A

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water Samples
 For CLP Total Metals By ICP-AES

Station Location :	WS4-280606-0958			WS5-280606-1016			MDL			CRQL								
Sample ID :	MY2M93			MY2M94														
Collection Date :	6/28/2006			6/28/2006														
Matrix :	GW			GW														
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	200U		D	200U		D	13.6			200								
ANTIMONY	60.0U			60.0U			6.2			60.0								
ARSENIC	10.0U			10.0U			4.5			10.0								
BARIUM	200U		D	200U		D	0.3			200								
BERYLLIUM	5.0U		D	5.0U		D	0.03			5.0								
CADMIUM	5.0U			5.0U			0.3			5.0								
CALCIUM	272000			268000			19.6			5000								
CHROMIUM	10.0U			10.0U			0.4			10.0								
COBALT	50.0U			50.0U			0.9			50.0								
COPPER	5.5L	J	B	5.3L	J	B	1.4			25.0								
IRON	127			129			6.8			100								
LEAD	10.0U			10.0U			4.4			10.0								
MAGNESIUM	153000			133000			4.7			5000								
MANGANESE	128			131			0.10			15.0								
MERCURY	0.033L	J	B	0.20U			0.030			0.20								
NICKEL	3.9L			40.0U		D	0.9			40.0								
POTASSIUM	39400			30100			2.5			5000								
SELENIUM	35.0U			35.0U			10.6			35.0								
SILVER	10.0U			10.0U			1.1			10.0								
SODIUM	762000			1150000			126			5000								
THALLIUM	25.0U			25.0U			5.3			25.0								
VANADIUM	0.83L	J	B	1.2L	J	B	0.6			50.0								
ZINC	60.0U		DF	60.0U	J	DF	1.2			60.0								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit N/A - Not Applicable NA - Not Analyzed

GW - Groundwater SW - Surface Water

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300 Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes & Site Assessment Section, SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: August 23, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	MY2M95
Laboratory:	Bonner Analytical Testing Company (BONNER)
Analysis:	CLP Total Metals
Samples:	6 Water Samples (see Case Summary)
Collection Date:	June 28 and 29, 2006
Reviewer:	Stan Kott, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Cynthia Gurley, CLP PO USEPA Region 4
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☒ FYI ☐ Action

SAMPLING ISSUES: ☒ Yes ☐ No

00105013-6927/35429/ MY2M95RPT

Data Validation Report

Case No.: 35429
SDG No.: MY2M95
Site: Halaco
Laboratory: Bonner Analytical Testing Company (BONNER)
Reviewer: Stan Kott, ESAT/LDC
Date: August 23, 2006

I. CASE SUMMARY

Sample Information

Samples: MY2M95, MY2M96, MY2M97, MY2M98, MY2M99,
and MY2MA0
Concentration and Matrix: Low Concentration Water
Analysis: CLP Total Metals
SOW: ILM05.3
Collection Date: June 28 and 29, 2006
Sample Receipt Date: July 1, 2006
Preparation Date: July 5 and 7, 2006
Analysis Date: July 6 and 7, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Background Samples (BG): MY2M96, MY2M97, MY2M98, and MY2M99
Field Duplicates (D1): MY2MA0 and MY2M92 (See Additional Comments)

Laboratory QC

Method Blanks & Associated Samples: Preparation Blank- Water (PBW) and samples
listed above
Matrix Spike: MY2M95S
Duplicates: MY2M95D
ICP Serial Dilution: MY2M95L

Analysis: CLP Total Metals

<u>Analyte</u>	<u>Sample Preparation and Digestion Date</u>	<u>Analysis Date</u>
ICP-AES Metals	July 5, 2006	July 6 and 7, 2006
Mercury	July 7, 2006	July 7, 2006
Percent Solids	Not Applicable	Not Applicable

CLP PO Action

None.

Sampling Issues

1. The cooler containing samples MY2M98 arrived at the laboratory with a temperature of 11°C. This temperature exceeds the temperature of $4^{\circ}\pm 2^{\circ}\text{C}$ specified in the Statement of Work (SOW). Since the water samples were preserved to a pH less than 2, no adverse effect on the quality of the data is expected.
2. The Traffic Report/Chain of Custody (TR/COC) record form did not specify a sample to be used for laboratory quality control (QC). The laboratory selected sample MY2M95 for laboratory QC analysis. The effect on data quality is not known.

Additional Comments

Several forms in the data package require correction. The corrected forms were requested from the laboratory but have not been received to date. Data quality is not likely to be affected and this report is considered final. (See attached TRL.)

The results for sample MY2M92, the field duplicate of sample MY2MA0, are included in Case 35429 SDG MY2M54.

All samples were analyzed between 10 to 40-fold dilutions due to sodium concentrations that exceed the instrument's linear range. Sample MY2MA0 was analyzed at a 3-fold dilution due to a potassium concentration that exceeds the instrument's linear range. No adverse effect on data quality is expected.

All method requirements specified in the EPA Contract Laboratory Program (CLP) Inorganic Statement of Work (SOW), except as noted, have been met.

Analytical results are listed in Table 1A with qualifications. Definitions of data qualifiers used in Table 1A are listed in Table 1B.

This report was prepared in accordance with the following documents:

- ▼ Region 9 Standard Operating Procedure 906, *Guidelines for Data Review of Contract Laboratory Program Analytical Services (CLPAS) Inorganic Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work For Inorganic Analysis Multi-Media, Multi-Concentration ILM05.3, March 2004; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Data Completeness	Yes	
2.	Sample Preservation and Holding Times	Yes	
3.	Calibration	Yes	
	a. Initial		
	b. Initial and Continuing Calibration Verification		
	c. CRQL Check Standard (CRI)		
4.	Blanks	Yes	B
5.	ICP Interference Check Sample (ICS)	Yes	
6.	Laboratory Control Sample (LCS)	Yes	
7.	Duplicate Sample Analysis	Yes	
8.	Matrix Spike Sample Analysis	Yes	
9.	ICP Serial Dilution Analysis	No	C
10.	ICP-MS Internal Standards	N/A	
11.	Field Duplicate Sample Analysis	No	D
12.	Sample Quantitation	Yes	A
13.	Overall Assessment	Yes	

N/A = Not Applicable

III. VALIDITY AND COMMENTS

- A. Results above the method detection limit (MDL) but below the contract required quantitation limit (CRQL) (denoted with an "L" qualifier) are estimated and flagged "J" in Table 1A.

Results above the MDL but below the CRQL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of quantitation.

- B. The following results are reported as non-detected (U) in Table 1A due to low level preparation blank contamination.

▼ Arsenic in samples MY2M95, MY2M96, MY2M98, MY2M99, and MY2MA0

The arsenic (8.6 µg/L) concentration in preparation blank PBW is greater than the MDL but less than the CRQL. Sample results greater than or equal to the MDL but less than the CRQL are reported as non-detected (U) at the CRQL.

A preparation blank is an analytical control that contains distilled, deionized water, or baked sand for solid matrices, and reagents, which is carried through the entire analytical procedure. The preparation blank is used to determine the level of contamination introduced by the laboratory during preparation and analysis.

- C. The following results are estimated and flagged "J" in Table 1A because an ICP serial dilution result is outside method QC limits.

▼ Potassium in all samples

The percent difference for the ICP serial dilution analysis of sample MY2M95L did not meet the 10% criterion for potassium as shown below.

Analyte	% Difference
Potassium	-13

Results reported for potassium in all samples are considered quantitatively uncertain. Chemical and physical interferences may exist due to sample matrix effects. The result for the diluted sample was lower than the original. Therefore, the reported sample results for potassium may be biased high.

A five-fold dilution of the laboratory QC sample is performed in association with the ICP procedure to indicate whether interference exists due to sample matrix effects. If the analyte concentration is sufficiently high (minimally a factor of 50 above the MDL in the original sample), the five fold serial dilution must agree within 10% of the original results after correction for dilution.

- D. The following relative percent differences (RPDs) and absolute difference were obtained for field duplicate pair MY2MA0 and MY2M92 listed below.

Analyte	RPD	Absolute Difference, µg/L
Aluminum	--	379
Manganese	+58	--
Potassium	+41	--

Since sampling variability is included in the measurement, field duplicate results are expected to vary more than laboratory duplicates which have a ▼20 RPD or ▼CRQL criteria for precision. The absolute difference for aluminum exceeds the 200 µg/L CRQL control limit. The effect on the quality of the data is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix, high levels of solids in the sample, or poor sampling or laboratory technique.

TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

In Reference to
Case: 35429 SDG No.: MY2M95

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM

Telephone Record Log

Date of Call: August 23, 2006

Laboratory Name: Bonner Analytical Testing Co. (BONNER)

Lab Contact: Daniel Antrim

Region: 9

Regional Contact: Steve Remaley, CLP PO

ESAT Reviewer: Stan Kott, ESAT/LDC

Call Initiated By: Laboratory X Region

In reference to data for the following sample(s): All

Summary of Questions/issues Discussed:

The following items were noted during the review of this sample delivery group (SDG) data package. Please respond within 4 days as specified in ILM05.3 Statement of Work (SOW), Exhibit B, Section 2, 2.2. Send response and resubmissions to

ICF International/Laboratory Data Consultants, Inc.,
Environmental Services Assistance Team, USEPA Region 9 Laboratory
1337 S. 46th Street, Building 201, Richmond, CA 94804, FAX 510 412-2304.

1. Forms 2A (Initial and Continuing Calibration Verification), 2B (CRQL Check Standard), 3 (Blanks), and 4A (ICP-AES Interference Check Sample) do not conform to the chronological reporting format specified in the SOW. Please review ILM05.3, Exhibit B, Section 3, parts 3.4.3.2.11 (ICV/CCV); 3.4.4.2.9 (CRI); 3.4.5.2.11 (Blank); and 3.4.6.2.15 (ICS) for the required format and provide corrected forms.
2. Form 9 (MDLs) (pages 34 and 35) require MDLs be reported with two significant figures. Please review ILM05.3, Exhibit B, Section 3, part 3.4.12.2.8 for the required format and provide corrected pages.

Summary of Resolution: To be determined.

Regional Contact Signature

Date of Resolution

ANALYTICAL RESULTS

Page 1 of 2

Case No. : 35429 SDG No. : MY2M95
 Site : HALACO ENGINEERING
 Lab : BONNER ANALYTICAL TESTING CO. (BONNER)
 Reviewer : Stan Kott, ESAT/LDC
 Date : August 23, 2006

Table 1A

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water
 Samples for CLP Total Metals

Station Location : WS11-280606-0955 Sample ID : MY2MA0 D1 Collection Date : 6/28/2006				WS6-290606-0815 MY2M95 6/29/2006			WS7-280606-1540 MY2M96 BG 6/28/2006			WS8-280606-1600 MY2M97 BG 6/28/2006			WS9-280606-1615 MY2M98 BG 6/28/2006			WS10-280606-1630 MY2M99 BG 6/28/2006		
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	804		D	534			20.0L			22.8L			47.0L			19.3L		
ANTIMONY	60.0U			60.0U			60.0U			6.2L			60.0U			60.0U		
ARSENIC	10.0U		B	10.0U		B	10.0U		B	10.0U			10.0U		B	10.0U		B
BARIUM	134L	J	A	59.4L	J	A	42.3L	J	A	37.1L	J	A	33.6L	J	A	34.3L	J	A
BERYLLIUM	0.21L	J	A	0.25L	J	A	0.090L	J	A	0.080L	J	A	0.080L	J	A	0.060L	J	A
CADMIUM	5.0U			5.0U			5.0U			5.0U			5.0U			5.0U		
CALCIUM	269000			291000			290000			284000			278000			284000		
CHROMIUM	10.0U			10.0U			10.0U			10.0U			10.0U			10.0U		
COBALT	50.0U			50.0U			50.0U			50.0U			50.0U			50.0U		
COPPER	60.2			15.9L	J	A	5.7L	J	A	5.5L	J	A	5.3L	J	A	5.2L	J	A
IRON	274			355			84.9L			102			192			141		
LEAD	10.0U			10.0U			10.0U			10.0U			10.0U			10.0U		
MAGNESIUM	292000			160000			215000			167000			141000			140000		
MANGANESE	602		D	98.8			110			109			118			154		
MERCURY	0.20U			0.20U			0.20U			0.20U			0.20U			0.20U		
NICKEL	3.8L	J	A	5.2L	J	A	3.6L	J	A	4.5L	J	A	3.9L	J	A	4.2L	J	A
POTASSIUM	243000	J	CD	41500	J	C	72700	J	C	47200	J	C	33500	J	C	32200	J	C
SELENIUM	35.0U			35.0U			35.0U			35.0U			35.0U			35.0U		
SILVER	10.0U			10.0U			10.0U			10.0U			10.0U			10.0U		
SODIUM	2040000			767000			1380000			872000			615000			605000		
THALLIUM	25.0U			25.0U			25.0U			25.0U			25.0U			25.0U		
VANADIUM	50.0U			1.5L	J	A	0.82L	J	A	0.63L	J	A	1.1L	J	A	1.6L	J	A
ZINC	32.9L	J	A	33.8L	J	A	5.1L	J	A	8.0L	J	A	13.1L	J	A	11.8L	J	A

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

ANALYTICAL RESULTS

Page 2 of 2

Case No. : 35429

SDG No. : MY2M95

Table 1A

Site : HALACO ENGINEERING

Lab : BONNER ANALYTICAL TESTING CO. (BONNER)

Reviewer : Stan Kott, ESAT/LDC

Date : August 23, 2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Low Concentration Water
Samples for CLP Total Metals

	MDL			CRQL														
PARAMETER	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
ALUMINUM	13.6			200														
ANTIMONY	6.2			60.0														
ARSENIC	4.5			10.0														
BARIUM	0.3			200														
BERYLLIUM	0.03			5.0														
CADMIUM	0.3			5.0														
CALCIUM	19.6			5000														
CHROMIUM	0.4			10.0														
COBALT	0.9			50.0														
COPPER	1.4			25.0														
IRON	6.8			100														
LEAD	4.4			10.0														
MAGNESIUM	4.7			5000														
MANGANESE	0.1			15.0														
MERCURY	0.06			0.20														
NICKEL	0.9			40.0														
POTASSIUM	2.5			5000														
SELENIUM	10.6			35.0														
SILVER	1.1			10.0														
SODIUM	126			5000														
THALLIUM	5.3			25.0														
VANADIUM	0.6			50.0														
ZINC	1.2			60.0														

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

MDL - Method Detection Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

CRQL - Contract Required Quantitation Limit

**Appendix H-6:
CLP Water VOCs**



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300; Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes and Site Assessment Section; SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, PMD-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: August 17, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	Y2M54
Laboratory:	KAP Technologies, Inc, (KAP)
Analysis:	Trace Volatiles
Samples:	20 Water Samples (see Case Summary)
Collection Date:	June 27 through 29, 2006
Reviewer:	Dennis Mayugba, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOM for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Ray Flores, CLP PO USEPA Region 6
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☒ Attention ☒ Action

SAMPLING ISSUES: ☐ Yes ☒ No

Data Validation Report

Case No.: 35429
SDG No.: Y2M54
Site: Halaco
Laboratory: KAP Technologies, Inc
Reviewer: Dennis Mayugba, ESAT/LDC
Date: August 17, 2006

I. CASE SUMMARY

Sample Information

Samples: Y2M54 through Y2M68 and Y2M91 through Y2M95
Concentration and Matrix: Trace Concentration Water
Analysis: Trace Volatiles
SOW: SOM01.1
Collection Date: June 27 through 29, 2006
Sample Receipt Date: July 1, 2006
Extraction Date: Not Applicable
Analysis Date: July 7, 8, 11, 13, and 14, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Trip Blanks (TB): Not Provided
Background Samples (BG): Y2M58 and Y2M67
Field Duplicates (D1): Y2M60 and Y2M64
Field Duplicates (D2): Y2M92 and Y2MA0 (in SDG Y2M90)

Laboratory QC

Method Blanks & Associated Samples:

VBLK15: Y2M54 through Y2M60, Y2M63, and Y2M65
VBLK17: Y2M61, Y2M55DL, Y2M61DL, Y2M62, Y2M64,
Y2M66, Y2M68, and Y2M91 through Y2M93
VBLK22: Y2M94, Y2M95, Y2M56MS, and Y2M56MSD
VBLK74: Y2M67
VBLK76: Storage blank VHBLK01

Tables

1A: Analytical Results with Qualifications
1B: Data Qualifier Definitions for Organic Data Review
2: Calibration Summary

CLP PO Action

Nondetected results for 1,4-dioxane in all samples, all method blanks, and storage blank VHBLK01 are qualified as rejected (R) due to very low relative response factors (<0.01) in the initial and continuing calibrations (see Comment A).

CLP PO Attention

1. Results for all analytes in sample Y2M67 are qualified as estimated (J) due to a holding time problem (see Comment B).
2. Results for acetone in all samples, all method blanks, and storage blank VHBLK01 are qualified as estimated (J) due to low relative response factors (see Comment C).
3. Results for some analytes are qualified as estimated (J) due to deuterated monitoring compound (DMC) recovery problems (see Comment D).
4. Results for some analytes in sample Y2M60 are qualified as estimated (J) due to an internal standard (IS) area problem (see Comment E)

Sampling Issues

None.

Additional Comments

Acetone was detected in background sample Y2M58 at a concentration of 8.1 ▼ g/L. No target analytes were detected in background sample Y2M67.

Other than laboratory artifacts (approximate retention times of 2.5, 4.3, 4.8, 7.2, 7.7, 10.3, 10.7, and 15.8 minutes), tentatively identified compounds (TICs) were found in samples Y2M55, Y2M60, Y2M61, Y2M64, and Y2M65 (see attached Form 1Js).

The laboratory performed manual integrations on calibrations and samples due to incorrect auto integration. Manual integrations were reviewed and found to be satisfactory and in compliance with proper integration techniques.

This report was prepared in accordance with the following documents:

- ▼ ESAT Region 9 Standard Operating Procedure 901, *Guidelines for Data Review of Contract Laboratory Program Analytical Services Volatile and Semivolatile Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work for Organics Analysis, *Multi-Media, Multi-Concentration*, SOM01.1, May 2005; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2005.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Holding Time/Preservation	No	B
2.	GC/MS Tune/GC Performance	Yes	
3.	Initial Calibration	No	A, C
4.	Continuing Calibration	No	A, C
5.	Laboratory Blanks	Yes	
6.	Field Blanks	N/A	
7.	Deuterated Monitoring Compounds	No	D
8.	Matrix Spike/Matrix Spike Duplicates	No	G
9.	Laboratory Control Samples/Duplicates	N/A	
10.	Internal Standards	No	E
11.	Compound Identification	Yes	
12.	Compound Quantitation	Yes	H
13.	System Performance	Yes	
14.	Field Duplicate Sample Analysis	No	F

N/A = Not Applicable

III. VALIDITY AND COMMENTS

- A. Nondetected results for the following analyte are qualified as rejected due to very low relative response factors (RRFs) in the initial and continuing calibrations and are flagged "R" in Table 1A.

- ▼ 1,4-Dioxane in all samples, all method blanks, and storage blank VHBLK01

Relative response factors (RRFs) below the 0.01 were reported for 1,4-dioxane in the initial and continuing calibrations (see Table 2). Since results are nondetected, false negatives may exist.

The DMC 1,4-dioxane-d8 also had RRFs below 0.01 in the initial and continuing calibrations and the DMC hexanone-d5 had an RRF below 0.01 in the 07/08/06 continuing calibration (see Table 2).

The RRF evaluates instrument sensitivity and is used in the quantitation of target analytes.

- B. Results for the following analytes are qualified as estimated due to a missed technical holding time and are flagged AJ@ in Table 1A.

- ▼ All analytes in sample Y2M67

This water analysis exceeded the 14-day 40 CFR 136 (Clean Water Act) technical holding time for preserved water samples as shown below. The SDG Narrative did not provide an explanation.

<u>Sample</u>	<u>Date Collected</u>	<u>Date Analyzed</u>	<u># of Days Exceeded</u>
Y2M67	06/27/06	07/13/06	2

Detected results for the samples listed above may be biased low. Where results are nondetected, false negatives may exist.

- C. Results for the following analyte are qualified as estimated due to low relative response factors (RRFs) in initial and continuing calibrations and are flagged "J" in Table 1A.

- ▼ Acetone in all samples, all method blanks, and storage blank VHBLK01

RRFs were below the 0.05 validation criterion for acetone in the initial and continuing calibrations (see Table 2).

Detected results for acetone should be considered as the minimum concentrations at which this analyte is present in the samples. Where results are nondetected, false negatives may exist.

DMCs 2-butanone-d5 and 2-hexanone-d5 also had RRFs below the 0.05 validation criterion in the initial and continuing calibrations (see Table 2). Quantitation of the analytes associated with these DMCs may have been affected by the low RRFs (see attached Table 9 from the Functional Guidelines).

The RRF evaluates instrument sensitivity and is used in the quantitation of target analytes.

- D. Results for the following analytes are qualified as estimated due to DMC recoveries outside QC limits and are flagged AJ@ in Table 1A.

{Chloroethane-d5}

- ▼ Dichlorodifluoromethane, chloromethane, bromomethane, chloroethane, and carbon disulfide in sample Y2M68

{1,1-Dichloroethene-d2}

- ▼ trans-1,2-Dichloroethene and cis-1,2-dichloroethene in sample Y2M61

DMC recoveries outside QC limits are shown below.

<u>Sample</u>	<u>DMC</u>	<u>% Recovery</u>	<u>QC Limits</u>
Y2M68	Chloroethane-d5	37	71-131
Y2M61	1,1-Dichloroethene-d2	54	55-104
Y2M54	1,2-Dichloroethane-d4	130	78-129
Y2M55	1,2-Dichloroethane-d4	130	78-129
Y2M58	1,2-Dichloroethane-d4	133	78-129
Y2M60	1,2-Dichloroethane-d4	131	78-129
Y2M66	1,2-Dichloroethane-d4	133	78-129

<u>Sample</u>	<u>DMC</u>	<u>% Recovery</u>	<u>QC Limits</u>
Y2M94	1,2-Dichloroethane-d4	137	78-129
Y2M55DL	1,2-Dichloroethane-d4	136	78-129
Y2M61DL	1,2-Dichloroethane-d4	139	78-129
Y2M56MS	trans-1,3-Dichloropropene-d4	67	73-121
Y2M56MSD	trans-1,3-Dichloropropene-d4	72	73-121
Y2M55	2-Hexanone-d5	145	28-135
Y2M62	2-Hexanone-d5	152	28-135
Y2M55	1,4-Dioxane-d8	202	50-150
Y2M60	1,4-Dioxane-d8	158	50-150
Y2M63	1,4-Dioxane-d8	166	50-150
Y2M55DL	1,4-Dioxane-d8	158	50-150
Y2M61DL	1,4-Dioxane-d8	153	50-150
Y2M61	1,4-Dioxane-d8	152	50-150
Y2M55	1,1,2,2-Tetrachloroethane-d2	133	73-125
Y2M60	1,1,2,2-Tetrachloroethane-d2	128	73-125
Y2M55DL	1,1,2,2-Tetrachloroethane-d2	126	73-125

Since results are nondetected, false negatives may exist. Detected results for affected analytes where DMC recoveries exceeded QC limits may be biased high. For DMC recoveries that exceeded QC limits, only detected results for associated analytes are qualified. Recoveries for DMCs 1,2-dichloroethane-d4, 2-hexanone-d5, 1,4-dioxane-d8, and 1,1,2,2-tetrachloroethane-d2 exceeded QC limits but results were not qualified because they were nondetects. The samples were not reanalyzed.

Surrogates (e.g., deuterated monitoring compounds (DMCs)) are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with DMCs prior to purging. DMCs provide information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

- E. Results for the following analytes are qualified as estimated due to a high internal standard (IS) area and are flagged AJ@ in Table 1A.

{Chlorobenzene-d5}

- ▼ 1,1,1-Trichloroethane, cyclohexane, carbon tetrachloride, benzene, trichloroethene, methylcyclohexane, 1,2-dichloropropane, bromodichloromethane, cis-1,3-dichloropropane, 4-methyl-2-pentanone, toluene, trans-1,3-dichloropropene, 1,1,2-trichloroethane, tetrachloroethene, 2-hexanone, dibromochloromethane, 1,2-dibromoethane, chlorobenzene, ethylbenzene, xylenes (total), styrene, isopropylbenzene, and 1,1,2,2-tetrachloroethane in sample Y2M60

The IS area outside QC limit is shown below.

<u>Sample</u>	<u>Internal Standard</u>	<u>Area</u>	<u>QC Limits</u>
Y2M60	Chlorobenzene-d5	13270322	5561732-12977375

Results for the affected analytes are considered quantitatively questionable. Where results are nondetected, false negatives may exist. The sample was not reanalyzed.

Internal standards, introduced into every calibration standard, blank, sample, and QC sample, monitor changes in analyte response due to matrix effects and fluctuations in instrument sensitivity throughout the analytical sequence. Internal standards are used to quantitate the concentration of target analytes and surrogate standards.

- F. In the analysis of the field duplicate pairs, the following outliers were reported.

<u>Analyte</u>	<u>Y2M60 (D1) Conc., ▼ g/L</u>	<u>Y2M64 (D1) Conc., ▼ g/L</u>	<u>RPD (<25%)</u>
Acetone	5.0U	40	N/A

<u>Analyte</u>	<u>Y2MA0 (D2) Conc., µg/L</u>	<u>Y2M92 (D2) Conc., µg/L</u>	<u>RPD (<25%)</u>
Acetone	5.3	5.0U	N/A

The effect on data quality is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix or poor sampling or laboratory technique.

- G. Matrix spike and matrix spike duplicate recoveries for trichloroethene (TCE), benzene, and chlorobenzene in QC samples Y2M56MS and Y2M56MSD did not meet the criteria for accuracy specified in the SOW, as shown below.

<u>Analyte</u>	<u>Y2M56MS % Recovery</u>	<u>Y2M56MSD % Recovery</u>	<u>QC limits % Recovery</u>
Trichloroethene	52	52	71-120
Benzene	74	74	76-127
Chlorobenzene	70	72	75-130

Results obtained may indicate poor laboratory technique or matrix effects which may interfere with analysis. Since TCE, benzene, and chlorobenzene results in sample Y2M56 are nondetected, false negatives may exist. The effect on data quality for other samples is not known.

Matrix spike sample analysis provides information about the effect of the sample matrix on sample preparation and measurement.

- H. Samples Y2M55 and Y2M61 were analyzed at 2-fold and 10-fold dilutions, respectively, due to high levels of acetone that exceeded the calibration range. Results for acetone in samples Y2M55 and Y2M61 are reported from the diluted analyses in Table 1A; results for other analytes are reported from the undiluted analyses.

TABLE 1B
DATA QUALIFIER DEFINITIONS FOR ORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared according to the document, "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2005.

- | | |
|----|---|
| U | The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method. |
| L | Indicates results which fall below the Contract Required Quantitation Limit. Results are estimated and are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection. |
| J | The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL). |
| NJ | The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration. |
| UJ | The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise. |
| R | The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample. |

Table 2
Calibration Summary

Case No.: 35429
SDG No.: Y2M54
Site: Halaco
Laboratory: KAP Technologies, Inc
Reviewer: Dennis Mayugba, ESAT/LDC
Date: August 17, 2006

RELATIVE RESPONSE FACTORS

	<u>RRF</u>	<u>RRF</u>	<u>RRF</u>	<u>RRF</u>	
Analysis date:	06/30/06	07/07/06	07/07/06	07/07/06	
Analysis time:	08:24-	11:46	21:20	22:05	
GC/MS I.D.:	C-5975	C-5975	C-5975	C-5975	
<u>Analyte</u>	<u>Init.</u>	<u>Cont.</u>	<u>Cont.</u>	<u>Cont.</u>	
Acetone	-----	0.048	-----	0.044	
1,4-Dioxane	0.002	0.002	0.002	0.002	
2-Butanone-d5	0.028	0.021	0.038	0.029	
2-Hexanone-d5	0.015	0.014	0.017	0.015	
1,4-Dioxane-d8	0.001	0.001	0.001	0.001	
	<u>RRF</u>	<u>RRF</u>	<u>RRF</u>		
Analysis date:	07/08/06	07/11/06	07/12/06		
Analysis time:	07:42	17:06	01:01		
GC/MS I.D.:	C-5975	C-5975	C-5975		
<u>Analyte</u>	<u>Cont.</u>	<u>Cont.</u>	<u>Cont.</u>		
Acetone	0.038	0.039	-----		
1,4-Dioxane	0.002	0.002	0.002		
2-Butanone-d5	0.017	0.022	0.027		
2-Hexanone-d5	0.008	0.013	0.015		
1,4-Dioxane-d8	0.001	0.001	0.001		
	<u>RRF</u>	<u>RRF</u>	<u>RRF</u>	<u>RRF</u>	<u>RRF</u>
Analysis date:	07/02/06	07/13/06	07/13/06	07/14/06	07/14/06
Analysis time:	08:10-	13:42	20:52	09:46	13:17
GC/MS I.D.:	A-5973	A-5973	A-5973	A-5973	A-5973
<u>Analyte</u>	<u>Init.</u>	<u>Cont.</u>	<u>Cont.</u>	<u>Cont.</u>	<u>Cont.</u>
Acetone	0.041	0.028	0.041	0.030	0.042
1,4-Dioxane	0.002	0.002	0.002	0.002	0.002
2-Butanone-d5	0.023	0.014	0.024	0.014	0.018
2-Hexanone-d5	0.014	0.010	0.015	0.011	0.012
1,4-Dioxane-d8	0.002	0.001	0.001	0.001	0.001

ASSOCIATED SAMPLES AND METHOD BLANKS

Initial, 06/30/06: Y2M54 through Y2M66, Y2M68, Y2M91 through Y2M95, Y2M55DL, Y2M61DL, Y2M56MS, Y2M56MSD; method blanks VBLK15, VBLK17, VBLK22

Cont., 07/07/06 (11:46): Y2M54 through Y2M60, Y2M63, Y2M65; method blank VBLK15

Cont., 07/07/06 (21:20): Y2M54 through Y2M60, Y2M63, Y2M65; method blank VBLK15

Cont., 07/07/06 (22:05): Y2M61, Y2M62, Y2M64, Y2M66, Y2M68, Y2M91 through Y2M93, Y2M55DL, Y2M661DL; method blank VBLK17

Cont., 07/08/06 (07:42): Y2M61, Y2M62, Y2M64, Y2M66, Y2M68, Y2M91 through Y2M93, Y2M55DL, Y2M661DL; method blank VBLK17

Cont., 07/11/06 (17:06): Y2M94, Y2M95, Y2M56MS, Y2M56MSD; method blank VBLK22

Cont., 07/12/06 (01:01): Y2M94, Y2M95, Y2M56MS, Y2M56MSD; method blank VBLK22

Initial, 07/02/06: Y2M67; storage blank VHBLK01; method blanks VBLK74 and VBLK76

Cont., 07/13/06 (13:42): Y2M67 and method blank VBLK74

Cont., 07/13/06 (20:52): Y2M67 and method blank VBLK74

Cont., 07/14/06 (09:46): Storage blank VHBLK01 and method blank VBLK76

Cont., 07/14/06 (13:17): Storage blank VHBLK01 and method blank VBLK76.

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Table 1A

Trace Level Water Samples

Concentration in ug/L

for Trace Volatiles

[illegible]

ANALYTICAL RESULTS

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Case No. : 35429 SDG No. : Y2M54

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : Dennis Mayugba ESAT/LDC

Date : 8/17/2006

Table 1A

QUALIFIED DATA
Concentration in ug/LAnalysis Type : Trace Level Water Samples
for Trace Volatiles

Station Location : MW11-280606-1647				MW12-280606-1550			MW1-270606-1810			MW13-280606-1738			MW14-280606-1500			MW15-280606-1822		
Sample ID : Y2M54				Y2M55			Y2M56			Y2M57			Y2M58 BG			Y2M59		
Collection Date : 6/28/2006				6/28/2006			6/28/2006			6/28/2006			6/28/2006			6/28/2006		
Dilution Factor : 1.0				1.0			1.0			1.0			1.0			1.0		
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Bromodichloromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
cis-1,3-Dichloropropene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
4-Methyl-2-pentanone	5.0U			5.0U			5.0U			5.0U			5.0U			5.0U		
Toluene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
trans-1,3-Dichloropropene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2-Trichloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Tetrachloroethene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
2-Hexanone	5.0U			5.0U			5.0U			5.0U			5.0U			5.0U		
Dibromochloromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dibromoethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Chlorobenzene	0.50U			0.50U			0.50U		G	0.50U			0.50U			0.50U		
Ethylbenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
o-Xylene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
m,p-Xylene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Styrene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Bromoform	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Isopropylbenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2,2-Tetrachloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,3-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,4-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dibromo-3-chloropropane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2,4-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2,3-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

CRQL - Contract Required Quantitation Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

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Table 1A

Trace Level Water Samples for Trace Volatiles

Station Location : MW16-280606-0925				MW17-290606-1105			MW18-290606-0930			MW19-280606-1030			MW20-280606-0945			MW2A-280606-0758		
Sample ID : Y2M60 D1				Y2M61			Y2M62			Y2M63			Y2M64 D1			Y2M65		
Collection Date : 6/28/2006				6/29/2006			6/29/2006			6/28/2006			6/28/2006			6/28/2006		
Dilution Factor : 1.0				1.0			1.0			1.0			1.0			1.0		
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Dichlorodifluoromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Chloromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Vinyl chloride	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Bromomethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Chloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Trichlorofluoromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1-Dichloroethene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Acetone	5.0U	J	CF	800	J	CH	160	J	C	60	J	C	40	J	CF	18	J	C
Carbon disulfide	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Methyl acetate	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Methylene chloride	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
trans-1,2-Dichloroethene	0.50U			0.50U	J	D	0.50U			0.50U			0.50U			0.50U		
Methyl tert-butyl ether	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1-Dichloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
cis-1,2-Dichloroethene	0.50U			0.50U	J	D	0.50U			0.50U			0.50U			0.50U		
2-Butanone	5.0U			40			7.0			12			5.0U			5.0U		
Bromochloromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Chloroform	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,1-Trichloroethane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Cyclohexane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Carbon tetrachloride	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Benzene	0.50U	J	E	0.50U			0.50U			0.68			0.50U			0.50U		
1,2-Dichloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,4-Dioxane	20U	R	A	20U	R	A	20U	R	A	20U	R	A	20U	R	A	20U	R	A
Trichloroethene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Methylcyclohexane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dichloropropane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		

ANALYTICAL RESULTS

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Case No. : 35429 SDG No. : Y2M54

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : Dennis Mayugba ESAT/LDC

Date : 8/17/2006

Table 1A

QUALIFIED DATA
Concentration in ug/LAnalysis Type : Trace Level Water Samples
for Trace Volatiles

Station Location : MW16-280606-0925				MW17-290606-1105			MW18-290606-0930			MW19-280606-1030			MW20-280606-0945			MW2A-280606-0758		
Sample ID : Y2M60 D1				Y2M61			Y2M62			Y2M63			Y2M64 D1			Y2M65		
Collection Date : 6/28/2006				6/29/2006			6/29/2006			6/28/2006			6/28/2006			6/28/2006		
Dilution Factor : 1.0				1.0			1.0			1.0			1.0			1.0		
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Bromodichloromethane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
cis-1,3-Dichloropropene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
4-Methyl-2-pentanone	5.0U	J	E	5.0U			5.0U			5.0U			5.0U			5.0U		
Toluene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
trans-1,3-Dichloropropene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2-Trichloroethane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Tetrachloroethene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
2-Hexanone	5.0U	J	E	5.0U			5.0U			5.0U			5.0U			5.0U		
Dibromochloromethane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dibromoethane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Chlorobenzene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Ethylbenzene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
o-Xylene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
m,p-Xylene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Styrene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
Bromoform	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Isopropylbenzene	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2,2-Tetrachloroethane	0.50U	J	E	0.50U			0.50U			0.50U			0.50U			0.50U		
1,3-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,4-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dibromo-3-chloropropane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2,4-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2,3-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

CRQL - Contract Required Quantitation Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

ANALYTICAL RESULTS

Page 5 of 10

Case No. : 35429

SDG No. : Y2M54

Table 1A

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : Dennis Mayugba ESAT/LDC

Date : 8/17/2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type :

Trace Level Water Samples
 for Trace Volatiles

Station Location : MW4-270606-1830				MW5-270606-1750			MW6-270606-1735			WS2-270606-1440			WS3-280606-0952			WS4-280606-0958		
Sample ID : Y2M66				Y2M67 BG			Y2M68			Y2M91			Y2M92 D2			Y2M93		
Collection Date : 6/27/2006				6/27/2006			6/27/2006			6/27/2006			6/28/2006			6/28/2006		
Dilution Factor : 1.0				1.0			1.0			1.0			1.0			1.0		
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Dichlorodifluoromethane	0.50U			0.50U	J	B	0.50U	J	D	0.50U			0.50U			0.50U		
Chloromethane	0.50U			0.50U	J	B	2.8	J	D	0.50U			0.50U			0.50U		
Vinyl chloride	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Bromomethane	0.50U			0.50U	J	B	0.50U	J	D	0.50U			0.50U			0.50U		
Chloroethane	0.50U			0.50U	J	B	0.50U	J	D	0.50U			0.50U			0.50U		
Trichlorofluoromethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,1-Dichloroethene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Acetone	6.6	J	C	5.0U	J	BC	9.8	J	C	5.0U	J	C	5.0U	J	CF	6.3	J	C
Carbon disulfide	0.50U			0.50U	J	B	0.50U	J	D	0.50U			0.50U			0.50U		
Methyl acetate	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Methylene chloride	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
trans-1,2-Dichloroethene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Methyl tert-butyl ether	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,1-Dichloroethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
cis-1,2-Dichloroethene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
2-Butanone	5.0U			5.0U	J	B	5.0U			5.0U			5.0U			5.0U		
Bromochloromethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Chloroform	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,1,1-Trichloroethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Cyclohexane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Carbon tetrachloride	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Benzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,2-Dichloroethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,4-Dioxane	20U	R	A	20U	R	AB	20U	R	A	20U	R	A	20U	R	A	20U	R	A
Trichloroethene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Methylcyclohexane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,2-Dichloropropane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		

ANALYTICAL RESULTS

Page 6 of 10

Case No. : 35429 SDG No. : Y2M54

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : Dennis Mayugba ESAT/LDC

Date : 8/17/2006

Table 1A

QUALIFIED DATA
Concentration in ug/L

Analysis Type : Trace Level Water Samples
for Trace Volatiles

Station Location : MW4-270606-1830				MW5-270606-1750			MW6-270606-1735			WS2-270606-1440			WS3-280606-0952			WS4-280606-0958		
Sample ID : Y2M66				Y2M67 BG			Y2M68			Y2M91			Y2M92			Y2M93		
Collection Date : 6/27/2006				6/27/2006			6/27/2006			6/27/2006			6/28/2006			6/28/2006		
Dilution Factor : 1.0				1.0			1.0			1.0			1.0			1.0		
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Bromodichloromethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
cis-1,3-Dichloropropene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
4-Methyl-2-pentanone	5.0U			5.0U	J	B	5.0U			5.0U			5.0U			5.0U		
Toluene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
trans-1,3-Dichloropropene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,1,2-Trichloroethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Tetrachloroethene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
2-Hexanone	5.0U			5.0U	J	B	5.0U			5.0U			5.0U			5.0U		
Dibromochloromethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,2-Dibromoethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Chlorobenzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Ethylbenzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
o-Xylene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
m,p-Xylene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Styrene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Bromoform	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
Isopropylbenzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,1,2,2-Tetrachloroethane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,3-Dichlorobenzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,4-Dichlorobenzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,2-Dichlorobenzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,2-Dibromo-3-chloropropane	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,2,4-Trichlorobenzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		
1,2,3-Trichlorobenzene	0.50U			0.50U	J	B	0.50U			0.50U			0.50U			0.50U		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

CRQL - Contract Required Quantitation Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

SDG No. : Y2M54

Table 1A

QUALIFIED DATA

Analysis Type :

Concentration in ug/L

Trace Level Water Samples for Trace Volatiles

[illegible]

ANALYTICAL RESULTS

Page 8 of 10

Case No. : 35429

SDG No. : Y2M54

Table 1A

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : Dennis Mayugba ESAT/LDC

Date : 8/17/2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type :

Trace Level Water Samples
for Trace Volatiles

Station Location :	WS5-280606-1016			WS6-290606-0815			Method Blank VBLK15			Method Blank VBLK17			Method Blank VBLK22			Method Blank VBLK74		
Sample ID :	Y2M94			Y2M95			1.0			1.0			1.0			1.0		
Collection Date :	6/28/2006			6/29/2006														
Dilution Factor :	1.0			1.0														
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Bromodichloromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
cis-1,3-Dichloropropene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
4-Methyl-2-pentanone	5.0U			5.0U			5.0U			5.0U			5.0U			5.0U		
Toluene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
trans-1,3-Dichloropropene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2-Trichloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Tetrachloroethene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
2-Hexanone	5.0U			5.0U			5.0U			5.0U			5.0U			5.0U		
Dibromochloromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dibromoethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Chlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Ethylbenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
o-Xylene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
m,p-Xylene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Styrene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Bromoform	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Isopropylbenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2,2-Tetrachloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,3-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,4-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dibromo-3-chloropropane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2,4-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2,3-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

CRQL - Contract Required Quantitation Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

SDG No. : Y2M54

Table 1A

QUALIFIED DATA

Analysis Type :

Trace Level Water Samples for Trace Volatiles

[illegible]

ANALYTICAL RESULTS

Page 10 of 10

Case No. : 35429

SDG No. : Y2M54

Table 1A

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : Dennis Mayugba ESAT/LDC

Date : 8/17/2006

QUALIFIED DATA
Concentration in ug/L

Analysis Type :

Trace Level Water Samples
for Trace Volatiles

Station Location :	Method Blank			Storage Blank			CRQL											
Sample ID :	VBLK76			VHBLK01														
Collection Date :																		
Dilution Factor :	1.0			1.0														
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Bromodichloromethane	0.50U			0.50U			0.50											
cis-1,3-Dichloropropene	0.50U			0.50U			0.50											
4-Methyl-2-pentanone	5.0U			5.0U			5.0											
Toluene	0.50U			0.50U			0.50											
trans-1,3-Dichloropropene	0.50U			0.50U			0.50											
1,1,2-Trichloroethane	0.50U			0.50U			0.50											
Tetrachloroethene	0.50U			0.50U			0.50											
2-Hexanone	5.0U			5.0U			5.0											
Dibromochloromethane	0.50U			0.50U			0.50											
1,2-Dibromoethane	0.50U			0.50U			0.50											
Chlorobenzene	0.50U			0.50U			0.50											
Ethylbenzene	0.50U			0.50U			0.50											
o-Xylene	0.50U			0.50U			0.50											
m,p-Xylene	0.50U			0.50U			0.50											
Styrene	0.50U			0.50U			0.50											
Bromoform	0.50U			0.50U			0.50											
Isopropylbenzene	0.50U			0.50U			0.50											
1,1,2,2-Tetrachloroethane	0.50U			0.50U			0.50											
1,3-Dichlorobenzene	0.50U			0.50U			0.50											
1,4-Dichlorobenzene	0.50U			0.50U			0.50											
1,2-Dichlorobenzene	0.50U			0.50U			0.50											
1,2-Dibromo-3-chloropropane	0.50U			0.50U			0.50											
1,2,4-Trichlorobenzene	0.50U			0.50U			0.50											
1,2,3-Trichlorobenzene	0.50U			0.50U			0.50											

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

CRQL - Contract Required Quantitation Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample



ICF International / Laboratory Data Consultants

Environmental Services Assistance Team, Region 9
1337 South 46th Street, Building 201, Richmond, CA 94804-4698
Phone: (510) 412-2300; Fax: (510) 412-2304

MEMORANDUM

TO: Matt Mitguard, Site Assessment Manager
States, Tribes and Site Assessment Section, SFD-9-1

THROUGH: Rose Fong, ESAT Task Order Manager (TOM)
Quality Assurance (QA) Program, MTS-3

FROM: Doug Lindelof, Data Review Task Manager
Region 9 Environmental Services Assistance Team (ESAT)

ESAT Contract No.: EP-W-06-041
Technical Direction Form No.: 00105013 Amendment 1

DATE: August 14, 2006

SUBJECT: Review of Analytical Data, Tier 3

Attached are comments resulting from ESAT Region 9 review of the following analytical data:

Site:	Halaco
Site Account No.:	09 X6 LA00
CERCLIS ID No.:	CAD00968805
Case No.:	35429
SDG No.:	Y2M90
Laboratory:	KAP Technologies, Inc, (KAP)
Analysis:	Volatiles
Samples:	6 Water Samples (see Case Summary)
Collection Date:	June 27 and 28, 2006
Reviewer:	April Martinez, ESAT/Laboratory Data Consultants

This report has been reviewed by the EPA TOPO for the ESAT contract, whose signature appears above.

If there are any questions, please contact Rose Fong (QA Program/EPA) at (415) 972-3812.

Attachment

cc: Ray Flores, CLP USEPA Region 6
Steve Remaley, CLP PO USEPA Region 9

CLP PO: ☒ Attention ☒ Action

SAMPLING ISSUES: ☐ Yes ☒ No

Data Validation Report

Case No.: 35429
SDG No.: Y2M90
Site: Halaco
Laboratory: KAP Technologies, Inc
Reviewer: April Martinez, ESAT/LDC
Date: August 14, 2006

I. CASE SUMMARY

Sample Information

Samples: Y2M90, Y2M96 through Y2M99, and Y2MA0
Concentration and Matrix: Trace Concentration Water
Analysis: Volatiles
SOW: SOM01.1
Collection Date: June 27 and 28, 2006
Sample Receipt Date: July 1, 2006
Extraction Date: Not Applicable
Analysis Date: July 11 and 12, 2006

Field QC

Field Blanks (FB): Not Provided
Equipment Blanks (EB): Not Provided
Trip Blanks (TB): Not Provided
Background Samples (BG): Y2M96, Y2M97, Y2M98, and Y2M99
Field Duplicates (D1): Y2MA0 and Y2M92 (in SDG Y2M54)

Laboratory QC

Method Blanks & Associated Samples:
VBLK22: Y2M90, Y2M96 through Y2M99, Y2MA0,
Y2M90MS, and Y2M90MSD
VBLK71: storage blank VHBLK01

Tables

1A: Analytical Results with Qualifications
1B: Data Qualifier Definitions for Organic Data Review
2: Calibration Summary

CLP PO Action

Nondetected results for 1,4-dioxane in all samples, all method blanks, and storage blank VHBLK01 are qualified as rejected (R) due to very low response factors (<0.01) in the initial and continuing calibrations (see Comment A).

CLP PO Attention

1. Results for acetone in all samples, all method blanks, and storage blank VHBLK01 are qualified as estimated (J) due to calibration problems (see Comment B).

2. The result for methyl tert-butyl ether in sample Y2M99 is qualified as estimated (J) due to a deuterated monitoring compound (DMC) recovery problem (see Comment C).

Sampling Issues

None.

Additional Comments

Acetone was detected in background samples Y2M96, Y2M97, Y2M98, and Y2M99 at concentrations of 5.4 ▼ g/L, 8.0 ▼ g/L, 7.8 ▼ g/L, and 8.2 ▼ g/L, respectively. Methyl tert-butyl ether was detected in background sample Y2M99 at a concentration of 0.51 ▼ g/L.

Other than laboratory artifacts (approximate retention times of 2.5, 7.2, and 10.7 minutes), tentatively identified compounds (TICs) were not found in the samples.

The laboratory performed manual integrations on calibrations due to incorrect auto integration. Manual integrations were reviewed and found to be satisfactory and in compliance with proper integration techniques.

This report was prepared in accordance with the following documents:

- ▼ ESAT Region 9 Standard Operating Procedure 901, *Guidelines for Data Review of Contract Laboratory Program Analytical Services Volatile and Semivolatile Data Packages*;
- ▼ USEPA Contract Laboratory Program Statement of Work for Organics Analysis, *Multi-Media, Multi-Concentration*, SOM01.1, May 2005; and
- ▼ USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2005.

II. VALIDATION SUMMARY

The data were evaluated based on the following parameters:

	<u>Parameter</u>	<u>Acceptable</u>	<u>Comment</u>
1.	Holding Time/Preservation	Yes	
2.	GC/MS Tune/GC Performance	Yes	
3.	Initial Calibration	No	A, B
4.	Continuing Calibration	No	A, B
5.	Laboratory Blanks	Yes	
6.	Field Blanks	N/A	
7.	Deuterated Monitoring Compounds	No	C
8.	Matrix Spike/Matrix Spike Duplicates	No	D
9.	Laboratory Control Samples/Duplicates	N/A	
10.	Internal Standards	Yes	
11.	Compound Identification	Yes	
12.	Compound Quantitation	Yes	
13.	System Performance	Yes	
14.	Field Duplicate Sample Analysis	No	E

N/A = Not Applicable

III. VALIDITY AND COMMENTS

- A. Nondetected results for the following analyte are qualified as rejected due to very low relative response factors (RRFs) in initial and continuing calibrations and are flagged "R" in Table 1A.

- ▼ 1,4-Dioxane in all samples, all method blanks, and storage blank VHBLK01

Relative response factors (RRFs) below the 0.01 were observed for the analyte listed above in the initial and continuing calibrations (see Table 2). Since results are nondetected, false negatives may exist.

The DMC 1,4-dioxane-d8 also had RRFs below 0.01 in the initial and continuing calibrations (see Table 2).

The RRF evaluates instrument sensitivity and is used in the quantitation of target analytes.

- B. Results for the following analyte are qualified as estimated due to low relative response factors (RRFs) in initial and continuing calibrations and are flagged "J" in Table 1A.

- ▼ Acetone in all samples, all method blanks, and storage blank VHBLK01

RRFs were below the 0.05 validation criterion for acetone in the initial and continuing calibrations (see Table 2).

Detected results for acetone should be considered as the minimum concentrations at which this analyte is present in the samples. Where results are nondetected, false negatives may exist.

DMCs 2-butanone-d5 and 2-hexanone-d5 also had RRFs below the 0.05 validation criterion in the initial calibration and continuing calibrations (see Table 2). Quantitation of the analytes associated with these DMCs may have been affected by the low RRFs (see attached Table 9 from the Functional Guidelines).

The RRF evaluates instrument sensitivity and is used in the quantitation of target analytes.

- C. The result for the following analyte is qualified as estimated due to a DMC recovery outside QC limits and is flagged AJ@ in Table 1A.

{ 1,2-Dichloroethane-d4 }

- ▼ Methyl tert-butyl ether in sample Y2M99

DMC recoveries outside QC limits are shown below.

<u>Sample</u>	<u>DMC</u>	<u>% Recovery</u>	<u>QC Limits</u>
Y2M97	1,2-Dichloroethane-d4	130	78-129
Y2M98	1,2-Dichloroethane-d4	133	78-129
Y2M99	1,2-Dichloroethane-d4	133	78-129

The detected result may be biased high. Recoveries for DMC 1,2-dichloroethane-d4 in samples Y2M97 and Y2M98 exceeded QC limits but results were not qualified because they were nondetects. The samples were not reanalyzed.

Surrogates (e.g., deuterated monitoring compounds (DMCs)) are organic compounds which are similar to the target analytes in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. All samples are spiked with DMCs prior to purging. DMCs provide information about both the laboratory performance on individual samples and the possible effects of the sample matrix on the analytical results.

- D. The matrix spike and matrix spike duplicate recoveries for trichloroethene (TCE) in QC samples Y2M90MS and Y2M90MSD did not meet the criteria for accuracy specified in the SOW, as shown below.

	Y2M90MS	Y2M90MSD		QC limits	
<u>Analyte</u>	<u>% Recovery</u>	<u>% Recovery</u>	<u>RPD</u>	<u>RPD</u>	<u>% Recovery</u>
Trichloroethene	66	66	0	14	71-120

Results obtained may indicate poor laboratory technique or matrix effects which may interfere with analysis. Since the TCE result in sample Y2M90 is nondetected,

a false negative may exist. The effect on data quality for other samples is not known.

Matrix spike sample analysis provides information about the effect of the sample matrix on sample preparation and measurement.

- E. In the analysis of the field duplicate pair, the following outlier was reported.

<u>Analyte</u>	<u>Y2MA0 (D1) Conc., µg/L</u>	<u>Y2M92 (D1) Conc., µg/L</u>	<u>RPD (<25%)</u>
Acetone	5.3	5.0U	N/A

The effect on data quality is not known.

The analysis of field duplicate samples is a measure of both field and analytical precision. The imprecision in the results of the analysis of the field duplicate pair may be due to the sample matrix or poor sampling or laboratory technique.

TABLE 1B
DATA QUALIFIER DEFINITIONS FOR ORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared according to the document, "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2005.

- | | |
|----|---|
| U | The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method. |
| L | Indicates results which fall below the Contract Required Quantitation Limit. Results are estimated and are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection. |
| J | The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL). |
| NJ | The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration. |
| UJ | The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise. |
| R | The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample. |

Table 2
Calibration Summary

Case No.: 35429
SDG No.: Y2M90
Site: Halaco
Laboratory: KAP Technologies, Inc
Reviewer: April Martinez, ESAT/LDC
Date: August 14, 2006

RELATIVE RESPONSE FACTORS

	<u>RRF</u>	<u>RRF</u>	<u>RRF</u>
Analysis date:	06/30/06	07/11/06	07/12/06
Analysis time:	-----	17:06	01:01
GC/MS I.D.:	C-5975	C-5975	C-5975
<u>Analyte</u>	<u>Init.</u>	<u>Cont.</u>	<u>Cont.</u>
Acetone	-----	0.039	-----
1,4-Dioxane	0.002	0.002	0.002
2-Hexanone-d5	0.015	0.013	0.015
2-Butanone-d5	0.028	0.022	0.027
1,4-Dioxane-d8	0.001	0.001	0.001

	<u>RRF</u>	<u>RRF</u>	<u>RRF</u>
Analysis date:	07/02/06	07/12/06	07/12/06
Analysis time:	-----	12:58	19:02
GC/MS I.D.:	A-5973	A-5973	A-5973
<u>Analyte</u>	<u>Init.</u>	<u>Cont.</u>	<u>Cont.</u>
Acetone	0.041	0.032	0.042
1,4-Dioxane	0.002	0.002	0.001
2-Hexanone-d5	0.014	0.012	0.014
2-Butanone-d5	0.023	0.019	0.023
1,4-Dioxane-d8	0.002	0.002	0.001

ASSOCIATED SAMPLES AND METHOD BLANKS

Initial 06/30/06: All samples and method blank VBLK22
Cont., 07/11/06 (17:06): All samples and method blank VBLK22
Cont., 07/12/06 (01:01): All samples and method blank VBLK22

Initial 07/02/06: Storage blank VHBLK01 and method blank VBLK71
Cont., 07/12/06 (12:58): Storage blank VHBLK01 and method blank VBLK71
Cont., 07/12/06 (19:02): Storage blank VHBLK01 and method blank VBLK71.

Table 1A

Date : 8/14/2006

Concentration in ug/L

Trace Level Water Samples for Trace Volatiles

[illegible]

ANALYTICAL RESULTS

Page 2 of 4

Case No. : 35429

SDG No. : Y2M90

Table 1A

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : April Martinez ESAT/LDC

Date : 8/14/2006

QUALIFIED DATA

Concentration in ug/L

Analysis Type :

Trace Level Water Samples
for Trace Volatiles

Station Location :	WS1-270606-1245			WS7-280606-1540			WS8-280606-1600			WS9-280606-1615			WS10-280606-1630			WS11-280606-0955		
Sample ID :	Y2M90			Y2M96 BG			Y2M97 BG			Y2M98 BG			Y2M99 BG			Y2MA0 D1		
Collection Date :	6/27/2006			6/28/2006			6/28/2006			6/28/2006			6/28/2006			6/28/2006		
Dilution Factor :	1.0			1.0			1.0			1.0			1.0			1.0		
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Bromodichloromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
cis-1,3-Dichloropropene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
4-Methyl-2-pentanone	5.0U			5.0U			5.0U			5.0U			5.0U			5.0U		
Toluene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
trans-1,3-Dichloropropene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2-Trichloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Tetrachloroethene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
2-Hexanone	5.0U			5.0U			5.0U			5.0U			5.0U			5.0U		
Dibromochloromethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dibromoethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Chlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Ethylbenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
o-Xylene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
m,p-Xylene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Styrene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Bromoform	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
Isopropylbenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,1,2,2-Tetrachloroethane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,3-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,4-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2-Dibromo-3-chloropropane	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2,4-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		
1,2,3-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50U			0.50U		

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

CRQL - Contract Required Quantitation Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

ANALYTICAL RESULTS

Page 3 of 4

Case No. : 35429

SDG No. : Y2M90

Table 1A

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : April Martinez ESAT/LDC

Date : 8/14/2006

QUALIFIED DATA

Concentration in ug/L

Analysis Type :

Trace Level Water Samples
for Trace Volatiles

Station Location :	Method Blank			Method Blank			Storage Blank			CRQL								
Sample ID :	VBLK22			VBLK71			VHBLK01											
Collection Date :																		
Dilution Factor :	1.0			1.0			1.0											
Trace Volatiles	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Dichlorodifluoromethane	0.50U			0.50U			0.50U			0.50								
Chloromethane	0.50U			0.50U			0.50U			0.50								
Vinyl chloride	0.50U			0.50U			0.50U			0.50								
Bromomethane	0.50U			0.50U			0.50U			0.50								
Chloroethane	0.50U			0.50U			0.50U			0.50								
Trichlorofluoromethane	0.50U			0.50U			0.50U			0.50								
1,1-Dichloroethene	0.50U			0.50U			0.50U			0.50								
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50U			0.50U			0.50U			0.50								
Acetone	5.0U	J	B	5.0U	J	B	5.0U	J	B	5.0								
Carbon disulfide	0.50U			0.50U			0.50U			0.50								
Methyl acetate	0.50U			0.50U			0.50U			0.50								
Methylene chloride	0.50U			0.50U			0.50U			0.50								
trans-1,2-Dichloroethene	0.50U			0.50U			0.50U			0.50								
Methyl tert-butyl ether	0.50U			0.50U			0.50U			0.50								
1,1-Dichloroethane	0.50U			0.50U			0.50U			0.50								
cis-1,2-Dichloroethene	0.50U			0.50U			0.50U			0.50								
2-Butanone	5.0U			5.0U			5.0U			5.0								
Bromochloromethane	0.50U			0.50U			0.50U			0.50								
Chloroform	0.50U			0.50U			0.50U			0.50								
1,1,1-Trichloroethane	0.50U			0.50U			0.50U			0.50								
Cyclohexane	0.50U			0.50U			0.50U			0.50								
Carbon tetrachloride	0.50U			0.50U			0.50U			0.50								
Benzene	0.50U			0.50U			0.50U			0.50								
1,2-Dichloroethane	0.50U			0.50U			0.50U			0.50								
1,4-Dioxane	20U	R	A	20U	R	A	20U	R	A	20								
Trichloroethene	0.50U			0.50U			0.50U			0.50								
Methylcyclohexane	0.50U			0.50U			0.50U			0.50								
1,2-Dichloropropane	0.50U			0.50U			0.50U			0.50								

ANALYTICAL RESULTS

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Case No. : 35429

SDG No. : Y2M90

Table 1A

Site : HALACO

Lab : KAP Technologies, Inc.

Reviewer : April Martinez ESAT/LDC

Date : 8/14/2006

QUALIFIED DATA

Concentration in ug/L

Analysis Type :

Trace Level Water Samples
for Trace Volatiles

Station Location : Sample ID : Collection Date : Dilution Factor :				Method Blank VBLK22 1.0			Method Blank VBLK71 1.0			Storage Blank VHBLK01 1.0			CRQL								
Trace Volatiles				Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com	Result	Val	Com
Bromodichloromethane	0.50U			0.50U			0.50U			0.50U			0.50								
cis-1,3-Dichloropropene	0.50U			0.50U			0.50U			0.50U			0.50								
4-Methyl-2-pentanone	5.0U			5.0U			5.0U			5.0U			5.0								
Toluene	0.50U			0.50U			0.50U			0.50U			0.50								
trans-1,3-Dichloropropene	0.50U			0.50U			0.50U			0.50U			0.50								
1,1,2-Trichloroethane	0.50U			0.50U			0.50U			0.50U			0.50								
Tetrachloroethene	0.50U			0.50U			0.50U			0.50U			0.50								
2-Hexanone	5.0U			5.0U			5.0U			5.0U			5.0								
Dibromochloromethane	0.50U			0.50U			0.50U			0.50U			0.50								
1,2-Dibromoethane	0.50U			0.50U			0.50U			0.50U			0.50								
Chlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50								
Ethylbenzene	0.50U			0.50U			0.50U			0.50U			0.50								
o-Xylene	0.50U			0.50U			0.50U			0.50U			0.50								
m,p-Xylene	0.50U			0.50U			0.50U			0.50U			0.50								
Styrene	0.50U			0.50U			0.50U			0.50U			0.50								
Bromoform	0.50U			0.50U			0.50U			0.50U			0.50								
Isopropylbenzene	0.50U			0.50U			0.50U			0.50U			0.50								
1,1,2,2-Tetrachloroethane	0.50U			0.50U			0.50U			0.50U			0.50								
1,3-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50								
1,4-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50								
1,2-Dichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50								
1,2-Dibromo-3-chloropropane	0.50U			0.50U			0.50U			0.50U			0.50								
1,2,4-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50								
1,2,3-Trichlorobenzene	0.50U			0.50U			0.50U			0.50U			0.50								

Val - Validity. Refer to Data Qualifiers in Table 1B.

Com - Comments. Refer to the Corresponding Section in the Narrative for each letter.

CRQL - Contract Required Quantitation Limit

N/A - Not Applicable

NA - Not Analyzed

D1, D2, etc. - Field Duplicate Pairs

FB - Field Blank, EB - Equipment Blank,

TB - Trip Blank, BG - Background Sample

Appendix H-7:
Radionuclides in Solid and Water Matrices




Weston Solutions, Inc.
Suite 200
190 Queen Anne Avenue North
Seattle, Washington 98109-4926
206-521-7600 Fax 206-521-7601
www.westonsolutions.com

MEMORANDUM

DATE: 28 September 2006

TO: Ben Castellana, Ph.D., Weston Solutions, Sherman Oaks

FROM: Paul Swift, Ph.D., Weston Solutions, Seattle 

SUBJECT: Review and Validation – Radiochemistry Data
Laboratory Group: 550874
Site: Halaco Engineering Company, Oxnard, California
Project: Integrated Assessment

CONTRACT: GSA W91238-05-F-0052

WORK ORDER: 12767.062.317.5000

cc: Weston Solutions project file

The quality assurance review and validation of analytical results from 1 soil sample, laboratory group **550874**, collected from the Halaco Engineering Company site, 6200 Perkins Road, Oxnard, Ventura County, California 27 June 2006 has been completed.

The single soil sample was analyzed for thorium isotopes (Th-228, Th-230, Th-232) and selected gamma-emitting isotopes (potassium-40 and cesium-136; K-40 and Cs-136) by General Engineering Laboratories, LLC, of Charleston, South Carolina. Samples were analyzed following DOE EML HASL Method 300, Th-01-RC (modified), alpha spectrometry by gas proportional counting, and EML HASL Method 300 (4.5.2.3), gamma spectrometry by scintillation counting, respectively.

The EDD Summary Report, listing the sample ID and method information for the laboratory group included in this review, is provided as an attachment.

Data Review, Verification, Validation, and Qualification

The following comments refer to the laboratory performance in meeting the quality control criteria described in the individual analytical methods. The review follows the format described in the *National Functional Guidelines for Inorganic Data Review* (USEPA 2004) and specific procedural details provided in the individual analytical methods and the analytical laboratory's standard operating procedures.

Electronic data deliverables compliant with EPA's Staged Electronic Data Deliverable (SEDD) Stage 2a Specification version 5.0 (EPA 2003) were provided by the laboratories as extensible markup language (XML) text files. These deliverables were processed using the LDC Parsing Tool, version 5.0, prior to importing into the LDC/USACE Automated Data Review (ADR) software. Using ADR, laboratory quality control results (method blanks, laboratory control standard and matrix spike recoveries, duplicate spike precision values), along with analysis holding time compliance, were evaluated relative to project quality control criteria specified in the Work Plan (Weston 2006). Detection and reporting limits also were compared to project-specified targets.

Other QC criteria (instrument calibrations, calibration check sample recoveries, and frequencies of QC sample analyses) were reviewed and verified manually.

Data validation was performed to assess overall data quality and usability relative to project data quality objectives (DQOs) specified in the project Quality Assurance Project Plan (QAPP).

RADIOCHEMICAL ANALYSIS – THORIUM ISOTOPES BY ALPHA SPECTROMETRY (DOE EML HASL 300, Th-01-RC -Modified)

1. Timeliness – acceptable

All samples met the project-specific holding time criterion of 40 days between sample collection and analysis.

2. Initial Calibration – acceptable

The initial calibration data met the acceptance criteria specified in the analytical method.

3. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. **Detection Limits** – *acceptable*

Laboratory minimum detectable activities (MDA) and method reporting limits (MRL) met project-required reporting limits. The laboratory data qualifier “B” was added by the reviewer to results detected between the MDA and MRL to facilitate ADR processing.

5. **Blank Sample Analysis** – *acceptable*

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

b) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

c) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. **Laboratory Control Sample Analysis (LCS)** – *acceptable*

Recoveries of the analytes from the LCS (blank spike) samples met the acceptance criteria in use at the laboratory.

7. **Matrix Spike Sample Analysis (MS)** – *acceptable*

Analyte recoveries from the MS samples were sufficient to meet project DQOs.

8. **Laboratory Duplicate Sample Analysis** – *acceptable*

Analytical precision, estimated through duplicate sample analysis, was sufficient to achieve project data quality objectives.

9. **Field Duplicate Sample Analysis** – *not applicable*

Field duplicate samples were not submitted for analysis.

10. **Sample Geometry** – *acceptable*

All counting sources were prepared in the same geometry as the calibration standards.

11. **Sample Analysis** – *acceptable*

All laboratory deliverables were present. No discrepancies were noted.

RADIOCHEMICAL ANALYSIS – GAMMA SPECTROMETRY (EML HASL 300-4.5.2.3)

1. Timeliness – acceptable

All samples met the project-specific holding time criterion of 40 days between sample collection and analysis.

2. Initial Calibration – acceptable

The initial calibration data met the acceptance criteria specified in the analytical method.

3. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. Detection Limits – acceptable

Laboratory minimum detectable activities (MDA) and method reporting limits (MRL) met project-required reporting limits. The laboratory data qualifier “B” was added by the reviewer to results detected between the MDA and MRL to facilitate ADR processing.

5. Blank Sample Analysis – acceptable

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

d) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

e) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. Laboratory Control Sample Analysis (LCS) – acceptable

Recoveries of the analytes from the LCS (blank spike) samples met the acceptance criteria in use at the laboratory.

7. Matrix Spike Sample Analysis (MS) – not applicable

Matrix spike sample analysis was not performed for this laboratory group.

8. Laboratory Control Sample Duplicate Analysis – *acceptable*

Analytical precision, estimated through duplicate sample analysis, was sufficient to achieve project data quality objectives.

9. Field Duplicate Sample Analysis – *not applicable*

Field duplicate samples were not submitted for analysis.

10. Sample Geometry – *acceptable*

All counting sources were prepared in the same geometry as the calibration standards.

11. Sample Analysis – *acceptable*

All laboratory deliverables were present. No discrepancies were noted.

Laboratory Contact

No other laboratory contact was required for corrective action purposes.

Data Assessment and Reconciliation with Project Data Quality Objectives

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the collection of samples for the project.

Upon consideration of the comments and data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

Any data qualifiers applied by the laboratory have been removed from the data summary sheets and superceded by data validation qualifiers as follow:

The following qualifiers are used to modify the data quality and usefulness of individual analytical results.

- U - The compound was analyzed for, but was not detected.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the laboratory reporting limit or lowest calibration standard.

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 550874				Laboratory : GEL			Lab Report Date : 08/14/2006		
Client Sample ID	Lab Sample ID	Analysis Method	Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SDB101-270606-1500	167573001	DOE EML HASL- RES	RES		SO	06/27/2006	07/20/2006		07/27/2006
		SO			06/27/2006	07/20/2006		08/02/2006	




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MEMORANDUM

DATE: 29 September 2006

TO: Ben Castellana, Ph.D., Weston Solutions, Sherman Oaks

FROM: Paul Swift, Ph.D., Weston Solutions, Seattle 

SUBJECT: Review and Validation – Radiochemistry Data
Laboratory Groups: 545042, 545083, 545086, 545092, 545368, 545369, 545370, 545372, and 545373
Site: Halaco Engineering Company, Oxnard, California
Project: Integrated Assessment

CONTRACT: GSA W91238-05-F-0052

WORK ORDER: 12767.062.317.5000

cc: Weston Solutions project file

The quality assurance review and validation of analytical results from 127 solid samples (84 soil and 43 sediment), laboratory groups **545042, 545083, 545086, 545092, 545368, 545369, 545370, 545372, and 545373**, collected from the Halaco Engineering Company site, 6200 Perkins Road, Oxnard, Ventura County, California between 27 June and 29 June 2006 has been completed.

The solid samples were analyzed for thorium isotopes (Th-228, Th-230, Th-232) and selected gamma-emitting isotopes (potassium-40 and cesium-136; K-40 and Cs-136) by General Engineering Laboratories, LLC, of Charleston, South Carolina. Samples were analyzed following DOE EML HASL Method 300, Th-01-RC (modified), alpha spectrometry by gas proportional counting, and EML HASL Method 300 (4.5.2.3), gamma spectrometry by scintillation counting, respectively.

The EDD Summary Report, listing the sample ID and method information for the laboratory groups included in this review, is provided as an attachment.

Data Review, Verification, Validation, and Qualification

The following comments refer to the laboratory performance in meeting the quality control criteria described in the individual analytical methods. The review follows the format described in the *National Functional Guidelines for Inorganic Data Review* (USEPA 2004) and specific procedural details provided in the individual analytical methods and the analytical laboratory's standard operating procedures.

Electronic data deliverables compliant with EPA's Staged Electronic Data Deliverable (SEDD) Stage 2a Specification version 5.0 (EPA 2003) were provided by the laboratories as extensible markup language (XML) text files. These deliverables were processed using the LDC Parsing Tool, version 5.0, prior to importing into the LDC/USACE Automated Data Review (ADR) software. Using ADR, laboratory quality control results (method blanks, laboratory control standard and matrix spike recoveries, duplicate spike precision values), along with analysis holding time compliance, were evaluated relative to project quality control criteria specified in the Work Plan (Weston 2006). Detection and reporting limits also were compared to project-specified targets.

Other QC criteria (instrument calibrations, calibration check sample recoveries, and frequencies of QC sample analyses) were reviewed and verified manually.

Data validation was performed to assess overall data quality and usability relative to project data quality objectives (DQOs) specified in the project Quality Assurance Project Plan (QAPP).

RADIOCHEMICAL ANALYSIS – THORIUM ISOTOPES BY ALPHA SPECTROMETRY (DOE EML HASL 300, Th-01-RC -Modified)

1. Timeliness – acceptable

All samples met the project-specific holding time criterion of 40 days between sample collection and analysis.

2. Initial Calibration – acceptable

The initial calibration data met the acceptance criteria specified in the analytical method.

3. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. Detection Limits – acceptable

Laboratory minimum detectable activities (MDA) and method reporting limits (MRL) met project-required reporting limits. The laboratory data qualifier “B” was added by the reviewer to results detected between the MDA and MRL to facilitate ADR processing.

5. Blank Sample Analysis – acceptable

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

b) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

c) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. Laboratory Control Sample Analysis (LCS) – acceptable

Recoveries of the analytes from the LCS (blank spike) samples met the acceptance criteria in use at the laboratory.

7. Matrix Spike Sample Analysis (MS) – acceptable

Analyte recoveries from the MS samples were sufficient to meet project DQOs.

8. Laboratory Duplicate Sample Analysis – acceptable

Analytical precision, estimated through duplicate sample analysis, was sufficient to achieve project data quality objectives.

9. Field Duplicate Sample Analysis – not applicable

Field duplicate samples were not submitted for analysis.

10. Sample Geometry – acceptable

All counting sources were prepared in the same geometry as the calibration standards.

11. Sample Analysis – acceptable

All laboratory deliverables were present. No discrepancies were noted.

RADIOCHEMICAL ANALYSIS – GAMMA SPECTROMETRY (EML HASL 300-4.5.3.2)

1. Timeliness – acceptable

All samples met the project-specific holding time criterion of 40 days between sample collection and analysis.

2. Initial Calibration – acceptable

The initial calibration data met the acceptance criteria specified in the analytical method.

3. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. Detection Limits – acceptable

Laboratory minimum detectable activities (MDA) and method reporting limits (MRL) met project-required reporting limits. The laboratory data qualifier “B” was added by the reviewer to results detected between the MDA and MRL to facilitate ADR processing.

5. Blank Sample Analysis – acceptable

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

d) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

e) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. Laboratory Control Sample Analysis (LCS) – acceptable

Recoveries of the analytes from the LCS (blank spike) samples met the acceptance criteria in use at the laboratory.

7. Matrix Spike Sample Analysis (MS) – not applicable

Matrix spike sample analysis was not performed for this laboratory group.

8. Laboratory Duplicate Sample Analysis

Analytical precision, estimated through duplicate sample analysis, was sufficient to achieve project data quality objectives, with the following exception.

Duplicate precision for analysis of sample **SW4-5/20-220606-1355** exceeded the acceptance criterion for thorium-228. Since the relative error ratio for the primary and duplicate sample analyses met the relative error ratio requirement specified in the method, the thorium-228 result in this sample only was qualified as an estimated concentration (J).

9. Field Duplicate Sample Analysis – *not applicable*

Field duplicate samples were not submitted for analysis.

10. Sample Geometry – *acceptable*

All counting sources were prepared in the same geometry as the calibration standards.

11. Sample Analysis

The cesium-137 results from samples **SDF16-280606-1620**, **SDF3-230606-1545**, and **SW5-4/15-260606-0851** were qualified as not detected at an estimated reporting limit (UJ) due to high peak width.

All laboratory deliverables were present. No other discrepancies were noted.

Laboratory Contact

No other laboratory contact was required for corrective action purposes.

Data Assessment and Reconciliation with Project Data Quality Objectives

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the collection of samples for the project.

Upon consideration of the comments and data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

Any data qualifiers applied by the laboratory have been removed from the data summary sheets and superceded by data validation qualifiers as follow:

The following qualifiers are used to modify the data quality and usefulness of individual analytical results.

- U - The compound was analyzed for, but was not detected.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the laboratory reporting limit or lowest calibration standard.
- UJ - The analyte not detected. The associated analytical result is an estimated detection limit due to QC exceedance(s).

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545368				Laboratory : GEL		Lab Report Date : 08/15/2006			
Client Sample ID	Lab Sample ID	Analysis Method	Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SDB100-260606-1400	166343001	DOE EML HASL- RES	RES		SO	06/28/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/28/2006	07/01/2006		07/21/2006
SDB17-270606-1425	166343002	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/18/2006
SDB18-270606-1430	166343003	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/18/2006
SDB20-270606-1439	166343004	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/18/2006
SDB23-270606-1451	166343005	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/18/2006
SDB26-270606-1502	166343006	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/18/2006
SDB30-270606-1512	166343007	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/21/2006
SDB31-270606-0809	166343008	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/18/2006
SDB32-270606-0816	166343009	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/21/2006
SDB33-270606-0822	166343010	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/21/2006
SDB34-270606-0830	166343011	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/21/2006
SDB35-270606-0840	166343012	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/21/2006
SDB36-270606-0845	166343013	DOE EML HASL- RES	RES		SO	06/27/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/27/2006	07/01/2006		07/21/2006
SDF101-230606-1600	166343014	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/23/2006	07/01/2006		07/21/2006
SDF10-290606-0800	166343015	DOE EML HASL- RES	RES		SO	06/29/2006	07/01/2006		07/14/2006

Project Number and Name: 12767.062.317.5000 - Halaco IA

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545042				Laboratory : GEL		Lab Report Date : 08/15/2006				
Client Sample ID	Lab Sample ID	Analysis Method		Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SDF10-290606-0800	166343015	EML HASL 300, 4 RES		RES		SO	06/29/2006	07/01/2006		07/21/2006
SDF11-280606-1535	166343016	DOE EML HASL-		RES		SO	06/28/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				SO	06/28/2006	07/01/2006		07/24/2006
SDF12-280606-1545	166343017	DOE EML HASL-		RES		SO	06/28/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				SO	06/28/2006	07/01/2006		07/24/2006
SDF1-230606-1415	166343018	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/24/2006
SDF13-280606-1555	166343019	DOE EML HASL-		RES		SO	06/28/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				SO	06/28/2006	07/01/2006		07/24/2006
SDF14-280606-1605	166343020	DOE EML HASL-		RES		SO	06/28/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				SO	06/28/2006	07/01/2006		07/24/2006
SDF15-280606-1610	166344001	DOE EML HASL-		RES		SO	06/28/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/28/2006	07/01/2006		07/24/2006
SDF16-280606-1620	166344002	DOE EML HASL-		RES		SO	06/28/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/28/2006	07/01/2006		07/24/2006
SDF2-230606-1535	166344003	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/24/2006
SDF3-230606-1545	166344004	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/24/2006
SDF4-230606-1620	166344005	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/24/2006
SDF5-230606-1625	166344006	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/24/2006
SDF6-260606-1125	166344007	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/26/2006
SDF7-280606-1505	166344008	DOE EML HASL-		RES		SO	06/28/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/28/2006	07/01/2006		07/20/2006
SDF8-280606-1515	166344009	DOE EML HASL-		RES		SO	06/28/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/28/2006	07/01/2006		07/24/2006

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545369				Laboratory : GEL		Lab Report Date : 08/15/2006				
Client Sample ID	Lab Sample ID	Analysis Method		Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SDF9-280606-1700	166344010	DOE EML HASL-	RES			SO	06/28/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/28/2006	07/01/2006		07/24/2006
SDM100-210606-1330	166344011	DOE EML HASL-	RES			SO	06/21/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/21/2006	07/01/2006		07/24/2006
SDM1-200606-1045	166344012	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SDM14-210606-1036	166344013	DOE EML HASL-	RES			SO	06/21/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/21/2006	07/01/2006		07/24/2006
SDM16-210606-1054	166344014	DOE EML HASL-	RES			SO	06/21/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/21/2006	07/01/2006		07/24/2006
SDM21-210606-1151	166344015	DOE EML HASL-	RES			SO	06/21/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/21/2006	07/01/2006		07/24/2006
SDM2-200606-1112	166344016	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SDM23-210606-1318	166344017	DOE EML HASL-	RES			SO	06/21/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/21/2006	07/01/2006		07/24/2006
SDM24-210606-1324	166344018	DOE EML HASL-	RES			SO	06/21/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/21/2006	07/01/2006		07/24/2006
SDM26-210606-1346	166344019	DOE EML HASL-	RES			SO	06/21/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/21/2006	07/01/2006		07/24/2006
SDM3-200606-1149	166344020	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SDM4-200606-1400	166345001	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/12/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/21/2006
SDM5-200606-1615	166345002	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/12/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/21/2006
SDM6-20606-1626	166345003	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/12/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/21/2006
SSA7-260606-1420	166345004	DOE EML HASL-	RES			SO	06/26/2006	07/01/2006		07/12/2006

Project Number and Name: 12767.062.317.5000 - Halaco IA

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545083 Laboratory : GEL Lab Report Date : 08/15/2006

Client Sample ID	Lab Sample ID	Analysis Method	Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SSA7-260606-1420	166345004	EML HASL 300, 4 RES	RES		SO	06/26/2006	07/01/2006		07/21/2006
SSA8-260606-1425	166345005	DOE EML HASL- RES	RES		SO	06/26/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/26/2006	07/01/2006		07/21/2006
SSN1/1-230606-0904	166345006	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/23/2006	07/01/2006		07/21/2006
SSN10/1-190606-1714	166345007	DOE EML HASL- RES	RES		SO	06/19/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/19/2006	07/01/2006		07/21/2006
SSN100-200606-0912	166345008	DOE EML HASL- RES	RES		SO	06/20/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/20/2006	07/01/2006		07/21/2006
SSN101-210606-1035	166345009	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/21/2006	07/01/2006		07/21/2006
SSN102-200606-0841	166345010	DOE EML HASL- RES	RES		SO	06/22/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/22/2006	07/01/2006		07/21/2006
SSN15-260606-0840	166345011	DOE EML HASL- RES	RES		SO	06/26/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/26/2006	07/01/2006		07/21/2006
SSN2/8-230606-1005	166345012	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES	RES		SO	06/23/2006	07/01/2006		07/21/2006
SSN33/8-210606-1029	166345013	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/21/2006	07/01/2006		07/21/2006
SSN35-210606-1125	166345014	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/21/2006	07/01/2006		07/21/2006
SSN40-210606-1340	166345015	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/21/2006	07/01/2006		07/21/2006
SSN49-210606-1450	166345016	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/21/2006	07/01/2006		07/21/2006
SSN5/8-230606-1203	166345017	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/23/2006	07/01/2006		07/19/2006
SSN51-210606-1555	166345018	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/12/2006
		EML HASL 300, 4 RES	RES		SO	06/21/2006	07/01/2006		07/19/2006

Project Number and Name: 12767.062.317.5000 - Halaco IA

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545370				Laboratory : GEL			Lab Report Date : 08/15/2006			
Client Sample ID	Lab Sample ID	Analysis Method		Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SSN54-220606-1315	166345019	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/12/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/21/2006
SSN55-220606-1335	166345020	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/12/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/21/2006
SSN58-220606-1350	166346001	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/19/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/24/2006
SSN60-220606-1400	166346002	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/19/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/24/2006
SSN62-220606-1410	166346003	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/19/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/24/2006
SSN74-220606-1519	166346004	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/19/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/24/2006
SSN75-220606-1524	166346005	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/19/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/24/2006
SSN86-220606-1630	166346006	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/19/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/24/2006
SSN94-200606-1406	166346007	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/19/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SSN95-200606-1433	166346008	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/20/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SSN96-200606-1436	166346009	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/20/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SSN97-200606-1440	166346010	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/20/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SSN98-200606-1447	166346011	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/20/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SSN99-200606-1452	166346012	DOE EML HASL-	RES			SO	06/20/2006	07/01/2006		07/20/2006
		EML HASL 300, 4	RES				06/20/2006	07/01/2006		07/24/2006
SSR11-270606-1215	166346013	DOE EML HASL-	RES			SO	06/27/2006	07/01/2006		07/20/2006

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EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545086				Laboratory : GEL		Lab Report Date : 08/15/2006				
Client Sample ID	Lab Sample ID	Analysis Method		Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SSR11-270606-1215	166346013	EML HASL 300, 4 RES		RES		SO	06/27/2006	07/01/2006		07/24/2006
SSR6-270606-1649	166346014	DOE EML HASL-		RES		SO	06/27/2006	07/01/2006		07/20/2006
		EML HASL 300, 4 RES				SO	06/27/2006	07/01/2006		07/24/2006
SSR8-270606-1702	166349009	DOE EML HASL-		RES		SO	06/27/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/27/2006	07/01/2006		07/25/2006
SW1-1/20-240606-1720	166346015	DOE EML HASL-		RES		SO	06/24/2006	07/01/2006		07/20/2006
		EML HASL 300, 4 RES				SO	06/24/2006	07/01/2006		07/24/2006
SW1-2/15-250606-1212	166346016	DOE EML HASL-		RES		SO	06/25/2006	07/01/2006		07/20/2006
		EML HASL 300, 4 RES				SO	06/25/2006	07/01/2006		07/24/2006
SW1-4/10-250606-1028	166346017	DOE EML HASL-		RES		SO	06/25/2006	07/01/2006		07/21/2006
		EML HASL 300, 4 RES				SO	06/25/2006	07/01/2006		07/24/2006
SW1-4/5-250606-1024	166346018	DOE EML HASL-		RES		SO	06/25/2006	07/01/2006		07/20/2006
		EML HASL 300, 4 RES				SO	06/25/2006	07/01/2006		07/24/2006
SW1-5/5-250606-0941	166346019	DOE EML HASL-		RES		SO	06/25/2006	07/01/2006		07/21/2006
		EML HASL 300, 4 RES				SO	06/25/2006	07/01/2006		07/25/2006
SW1-6/20-250606-0920	166346020	DOE EML HASL-		RES		SO	06/25/2006	07/01/2006		07/20/2006
		EML HASL 300, 4 RES				SO	06/25/2006	07/01/2006		07/25/2006
SW1-7/15-250606-0825	166347001	DOE EML HASL-		RES		SO	06/25/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/25/2006	07/01/2006		07/19/2006
SW2-1/20-230606-1703	166347002	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/27/2006
SW2-3/15-240606-1203	166347003	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/20/2006
SW2-4/15-240606-0838	166347004	DOE EML HASL-		RES		SO	06/24/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/24/2006	07/01/2006		07/24/2006
SW2-5/15-240606-0926	166347005	DOE EML HASL-		RES		SO	06/24/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/24/2006	07/01/2006		07/24/2006
SW2-6/20-240606-1030	166347006	DOE EML HASL-		RES		SO	06/24/2006	07/01/2006		07/18/2006
		EML HASL 300, 4 RES				SO	06/24/2006	07/01/2006		07/20/2006

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545372				Laboratory : GEL		Lab Report Date : 08/15/2006				
Client Sample ID	Lab Sample ID	Analysis Method		Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SW2-7/5-240606-1044	166347007	DOE EML HASL-	RES			SO	06/24/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/24/2006	07/01/2006		07/25/2006
SW2-9/5-230606-0930	166347008	DOE EML HASL-	RES			SO	06/23/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/23/2006	07/01/2006		07/25/2006
SW3-1/10-270606-1628	166347009	DOE EML HASL-	RES			SO	06/27/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/27/2006	07/01/2006		07/25/2006
SW3-2/20-280606-1028	166347010	DOE EML HASL-	RES			SO	06/28/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/28/2006	07/01/2006		07/25/2006
SW3-3/10-280606-0904	166347011	DOE EML HASL-	RES			SO	06/28/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/28/2006	07/01/2006		07/25/2006
SW3-4/5-270606-1523	166347012	DOE EML HASL-	RES			SO	06/27/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/27/2006	07/01/2006		07/26/2006
SW3-5/20-270606-1415	166347013	DOE EML HASL-	RES			SO	06/27/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/27/2006	07/01/2006		07/26/2006
SW3-6/10-270606-1309	166347014	DOE EML HASL-	RES			SO	06/27/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/27/2006	07/01/2006		07/26/2006
SW3-7/20-270606-1230	166347015	DOE EML HASL-	RES			SO	06/27/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/27/2006	07/01/2006		07/26/2006
SW3-9/10-270606-1100	166347016	DOE EML HASL-	RES			SO	06/27/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/27/2006	07/01/2006		07/26/2006
SW4-1/5-220606-1545	166347017	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/26/2006
SW4-3/5-240606-1537	166347019	DOE EML HASL-	RES			SO	06/24/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/24/2006	07/01/2006		07/26/2006
SW4-4/10-220606-1255	166347020	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/18/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/27/2006
SW4-5/20-220606-1355	166348001	DOE EML HASL-	RES			SO	06/22/2006	07/01/2006		07/13/2006
		EML HASL 300, 4	RES				06/22/2006	07/01/2006		07/25/2006
SW4-6/20-270606-0945	166348002	DOE EML HASL-	RES			SO	06/27/2006	07/01/2006		07/13/2006

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EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545092			Laboratory : GEL			Lab Report Date : 08/15/2006				
Client Sample ID	Lab Sample ID	Analysis Method		Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SW4-6/20-270606-0945	166348002	EML HASL 300, 4 RES		RES		SO	06/27/2006	07/01/2006		07/25/2006
SW4-7/15-270606-0845	166348003	DOE EML HASL-		RES		SO	06/27/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/27/2006	07/01/2006		07/25/2006
SW5-1/5-260606-1046	166348004	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/25/2006
SW5-2/15-260606-1012	166348005	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/25/2006
SW5-3/20-260606-0935	166348006	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/26/2006
SW5-4/15-260606-0851	166348007	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/26/2006
SW5-5/5-260606-1130	166348008	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/26/2006
SW5-6/5-260606-1414	166348009	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/26/2006
SW5-7/10-260606-1708	166348010	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/26/2006
SW5-9/15-260606-0945	166348011	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/26/2006
SWF1-260606-1242	166348012	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/26/2006
SWF5-260606-1325	166348013	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/25/2006
SWF6-260606-1115	166348014	DOE EML HASL-		RES		SO	06/26/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/26/2006	07/01/2006		07/25/2006
SWL100-230606-1400	166348015	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/25/2006
SWL13-230606-1115	166348016	DOE EML HASL-		RES		SO	06/23/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				SO	06/23/2006	07/01/2006		07/25/2006

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EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545373			Laboratory : GEL			Lab Report Date : 08/15/2006			
Client Sample ID	Lab Sample ID	Analysis Method	Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
SWL19-230606-1212	166348017	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/23/2006	07/01/2006	07/25/2006	
SWL21-230606-1411	166348018	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/23/2006	07/01/2006	07/25/2006	
SWL22-230606-1418	166348019	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/23/2006	07/01/2006	07/25/2006	
SWL31-210606-1720	166348020	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/21/2006	07/01/2006	07/25/2006	
SWL32-210606-1725	166349001	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/21/2006	07/01/2006	07/25/2006	
SWL3-230606-0835	166349002	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/23/2006	07/01/2006	07/25/2006	
SWL33-210606-1730	166349003	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/21/2006	07/01/2006	07/25/2006	
SWL34-210606-1735	166349004	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/21/2006	07/01/2006	07/25/2006	
SWL35-210606-1740	166349005	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/21/2006	07/01/2006	07/25/2006	
SWL36-210606-1745	166349006	DOE EML HASL- RES	RES		SO	06/21/2006	07/01/2006		07/13/2006
		EML HASL 300, 4 RES				06/21/2006	07/01/2006	07/25/2006	
SWL5-230606-0842	166349007	DOE EML HASL- RES	RES		SO	06/23/2006	07/01/2006		07/14/2006
		EML HASL 300, 4 RES				06/23/2006	07/01/2006	07/25/2006	




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MEMORANDUM

DATE: 28 September 2006

TO: Ben Castellana, Ph.D., Weston Solutions, Sherman Oaks

FROM: Paul Swift, Ph.D., Weston Solutions, Seattle 

SUBJECT: Review and Validation – Radiochemistry Data
Laboratory Groups: 545129, 545364
Site: Halaco Engineering Company, Oxnard, California
Project: Integrated Assessment

CONTRACT: GSA W91238-05-F-0052

WORK ORDER: 12767.062.317.5000

cc: Weston Solutions project file

The quality assurance review and validation of analytical results from 20 water samples (14 ground and 6 surface waters), laboratory groups **545129** and **545364**, collected from the Halaco Engineering Company site, 6200 Perkins Road, Oxnard, Ventura County, California between 27 June and 29 June 2006 has been completed.

The water samples were analyzed for thorium isotopes (Th-228, Th-230, Th-232) and selected gamma-emitting isotopes (potassium-40 and cesium-136; K-40 and Cs-136) by General Engineering Laboratories, LLC, of Charleston, South Carolina. Samples were analyzed following DOE EML HASL Method 300, Th-01-RC (modified), alpha spectrometry by gas proportional counting, and EPA Method 901.1, gamma spectrometry by scintillation counting, respectively.

The EDD Summary Report, listing the sample ID and method information for the laboratory groups included in this review, is provided as an attachment.

Data Review, Verification, Validation, and Qualification

The following comments refer to the laboratory performance in meeting the quality control criteria described in the individual analytical methods. The review follows the format described in the *National Functional Guidelines for Inorganic Data Review* (USEPA 2004) and specific procedural details provided in the individual analytical methods and the analytical laboratory's standard operating procedures.

Electronic data deliverables compliant with EPA's Staged Electronic Data Deliverable (SEDD) Stage 2a Specification version 5.0 (EPA 2003) were provided by the laboratories as extensible markup language (XML) text files. These deliverables were processed using the LDC Parsing Tool, version 5.0, prior to importing into the LDC/USACE Automated Data Review (ADR) software. Using ADR, laboratory quality control results (method blanks, laboratory control standard and matrix spike recoveries, duplicate spike precision values), along with analysis holding time compliance, were evaluated relative to project quality control criteria specified in the Work Plan (Weston 2006). Detection and reporting limits also were compared to project-specified targets.

Other QC criteria (instrument calibrations, calibration check sample recoveries, and frequencies of QC sample analyses) were reviewed and verified manually.

Data validation was performed to assess overall data quality and usability relative to project data quality objectives (DQOs) specified in the project Quality Assurance Project Plan (QAPP).

RADIOCHEMICAL ANALYSIS – THORIUM ISOTOPES BY ALPHA SPECTROMETRY (DOE EML HASL 300, Th-01-RC -Modified)

1. Timeliness – acceptable

All samples met the project-specific holding time criterion of 40 days between sample collection and analysis.

2. Initial Calibration – acceptable

The initial calibration data met the acceptance criteria specified in the analytical method.

3. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. Detection Limits – acceptable

Laboratory minimum detectable activities (MDA) and method reporting limits (MRL) met project-required reporting limits. The laboratory data qualifier “B” was added by the reviewer to results detected between the MDA and MRL to facilitate ADR processing.

5. Blank Sample Analysis – acceptable

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

b) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

c) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. Laboratory Control Sample Analysis (LCS) – acceptable

Recoveries of the analytes from the LCS (blank spike) samples met the acceptance criteria in use at the laboratory.

7. Matrix Spike Sample Analysis (MS) – acceptable

Analyte recoveries from the MS sample were sufficient to meet project DQOs.

8. Laboratory Duplicate Sample Analysis – acceptable

Analytical precision, estimated through duplicate sample analysis, was sufficient to achieve project data quality objectives.

9. Field Duplicate Sample Analysis – not applicable

Field duplicate samples were not submitted for analysis.

10. Sample Geometry – acceptable

All counting sources were prepared in the same geometry as the calibration standards.

11. Sample Analysis – acceptable

All laboratory deliverables were present. No discrepancies were noted.

RADIOCHEMICAL ANALYSIS – GAMMA SPECTROMETRY (EPA 901.1)

1. Timeliness – acceptable

All samples met the project-specific holding time criterion of 40 days between sample collection and analysis.

2. Initial Calibration – acceptable

The initial calibration data met the acceptance criteria specified in the analytical method.

3. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. Detection Limits – acceptable

Laboratory minimum detectable activities (MDA) and method reporting limits (MRL) met project-required reporting limits. The laboratory data qualifier “B” was added by the reviewer to results detected between the MDA and MRL to facilitate ADR processing.

5. Blank Sample Analysis – acceptable

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

d) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

e) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. Laboratory Control Sample Analysis (LCS) – acceptable

Recoveries of the analytes from the LCS (blank spike) sample met the acceptance criteria in use at the laboratory.

7. Matrix Spike Sample Analysis (MS) – acceptable

Recoveries of the analytes from the MS sample met the acceptance criteria in use at the laboratory.

8. **Laboratory Duplicate Sample Analysis** – *acceptable*

Analytical precision, estimated through duplicate sample analysis, was sufficient to achieve project data quality objectives.

9. **Field Duplicate Sample Analysis** – *not applicable*

Field duplicate samples were not submitted for analysis.

10. **Sample Geometry** – *acceptable*

All counting sources were prepared in the same geometry as the calibration standards.

11. **Sample Analysis** – *acceptable*

Potassium-40 results from samples **MW15-280606-1822** and **WS10-280606-1630** were qualified as not detected at an estimated reporting limit (UJ) due to high counting uncertainty.

The potassium-40 result from sample **WS1-280606-1245** was qualified as not detected at an estimated reporting limit (UJ) due to low abundance.

The cesium-137 result from sample **MW2A-280606-0758** was qualified as not detected at an estimated reporting limit (UJ) due to high peak width.

All laboratory deliverables were present. No other discrepancies were noted.

Laboratory Contact

No other laboratory contact was required for corrective action purposes.

Data Assessment and Reconciliation with Project Data Quality Objectives

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the collection of samples for the project.

Upon consideration of the comments and data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

Any data qualifiers applied by the laboratory have been removed from the data summary sheets and superceded by data validation qualifiers as follow:

The following qualifiers are used to modify the data quality and usefulness of individual analytical results.

- U - The compound was analyzed for, but was not detected.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the laboratory reporting limit or lowest calibration standard.

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545129				Laboratory : GEL		Lab Report Date : 08/14/2006				
Client Sample ID	Lab Sample ID	Analysis Method		Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
MW11-280606-1647	166319003	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			
MW12-280606-1550	166319004	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/24/2006
		06/28/2006	07/01/2006				07/25/2006			
MW1-270606-1810	166319005	901.1	RES	DOE EML HASL-3	RES	AQ	06/27/2006	07/01/2006	07/01/2006	07/20/2006
		06/27/2006	07/01/2006				07/25/2006			
MW13-280606-1738	166319006	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			
MW14-280606-1500	166319007	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			
MW15-280606-1822	166319008	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			
MW16-280606-0925	166319001	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			
MW18-290606-0930	166319002	901.1	RES	DOE EML HASL-3	RES	AQ	06/29/2006	07/01/2006	07/01/2006	07/20/2006
		06/29/2006	07/01/2006				07/25/2006			
MW19-280606-1030	166319009	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			
MW20-280606-0945	166319010	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			
MW2A-280606-0758	166319011	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			
MW4-270606-1830	166319012	901.1	RES	DOE EML HASL-3	RES	AQ	06/27/2006	07/01/2006	07/01/2006	07/20/2006
		06/27/2006	07/01/2006				07/25/2006			
MW5-270606-1750	166319013	901.1	RES	DOE EML HASL-3	RES	AQ	06/27/2006	07/01/2006	07/01/2006	07/20/2006
		06/27/2006	07/01/2006				07/25/2006			
MW6-270606-1735	166319014	901.1	RES	DOE EML HASL-3	RES	AQ	06/27/2006	07/01/2006	07/01/2006	07/20/2006
		06/27/2006	07/01/2006				07/25/2006			
WS10-280606-1630	166319015	901.1	RES	DOE EML HASL-3	RES	AQ	06/28/2006	07/01/2006	07/01/2006	07/20/2006
		06/28/2006	07/01/2006				07/25/2006			

Project Number and Name: 12767.062.317.5000 - Halaco IA

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545364			Laboratory : GEL			Lab Report Date : 08/14/2006			
Client Sample ID	Lab Sample ID	Analysis Method	Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
WS10-280606-1630	166319015	DOE EML HASL-3 RES			AQ	06/28/2006	07/01/2006		07/25/2006
WS11-280606-0955	166319016	901.1 RES			AQ	06/28/2006	07/01/2006		07/20/2006
		DOE EML HASL-3 RES			AQ	06/28/2006	07/01/2006		07/25/2006
WS1-270606-1245	166319017	901.1 RES			AQ	06/27/2006	07/01/2006		07/20/2006
		DOE EML HASL-3 RES			AQ	06/27/2006	07/01/2006		07/22/2006
WS2-270606-1440	166319018	901.1 RES			AQ	06/27/2006	07/01/2006		07/20/2006
		DOE EML HASL-3 RES			AQ	06/27/2006	07/01/2006		07/22/2006
WS3-280606-0952	166319019	901.1 RES			AQ	06/28/2006	07/01/2006		07/20/2006
		DOE EML HASL-3 RES			AQ	06/28/2006	07/01/2006		07/22/2006
WS4-280606-0958	166319020	901.1 RES			AQ	06/28/2006	07/01/2006		07/20/2006
		DOE EML HASL-3 RES			AQ	06/28/2006	07/01/2006		07/22/2006




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MEMORANDUM

DATE: 28 September 2006

TO: Ben Castellana, Ph.D., Weston Solutions, Sherman Oaks

FROM: Paul Swift, Ph.D., Weston Solutions, Seattle 

SUBJECT: Review and Validation – Radiochemistry Data
Laboratory Group: 545133
Site: Halaco Engineering Company, Oxnard, California
Project: Integrated Assessment

CONTRACT: GSA W91238-05-F-0052

WORK ORDER: 12767.062.317.5000

cc: Weston Solutions project file

The quality assurance review and validation of analytical results from 5 ground water samples, laboratory group **545133**, collected from the Halaco Engineering Company site, 6200 Perkins Road, Oxnard, Ventura County, California between 27 June and 29 June 2006 has been completed.

The water samples were analyzed for thorium isotopes (Th-228, Th-230, Th-232) and selected gamma-emitting isotopes (potassium-40 and cesium-136; K-40 and Cs-136) by General Engineering Laboratories, LLC, of Charleston, South Carolina. Samples were analyzed following DOE EML HASL Method 300, Th-01-RC (modified), alpha spectrometry by gas proportional counting, and EPA Method 901.1, gamma spectrometry by scintillation counting, respectively.

The EDD Summary Report, listing the sample ID and method information for the laboratory groups included in this review, is provided as an attachment.

Data Review, Verification, Validation, and Qualification

The following comments refer to the laboratory performance in meeting the quality control criteria described in the individual analytical methods. The review follows the format described in the *National Functional Guidelines for Inorganic Data Review* (USEPA 2004) and specific procedural details provided in the individual analytical methods and the analytical laboratory's standard operating procedures.

Electronic data deliverables compliant with EPA's Staged Electronic Data Deliverable (SEDD) Stage 2a Specification version 5.0 (EPA 2003) were provided by the laboratories as extensible markup language (XML) text files. These deliverables were processed using the LDC Parsing Tool, version 5.0, prior to importing into the LDC/USACE Automated Data Review (ADR) software. Using ADR, laboratory quality control results (method blanks, laboratory control standard and matrix spike recoveries, duplicate spike precision values), along with analysis holding time compliance, were evaluated relative to project quality control criteria specified in the Work Plan (Weston 2006). Detection and reporting limits also were compared to project-specified targets.

Other QC criteria (instrument calibrations, calibration check sample recoveries, and frequencies of QC sample analyses) were reviewed and verified manually.

Data validation was performed to assess overall data quality and usability relative to project data quality objectives (DQOs) specified in the project Quality Assurance Project Plan (QAPP).

RADIOCHEMICAL ANALYSIS – THORIUM ISOTOPES BY ALPHA SPECTROMETRY (DOE EML HASL 300, Th-01-RC -Modified)

1. Timeliness – acceptable

All samples met the project-specific holding time criterion of 40 days between sample collection and analysis.

2. Initial Calibration – acceptable

The initial calibration data met the acceptance criteria specified in the analytical method.

3. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. Detection Limits – acceptable

Laboratory minimum detectable activities (MDA) and method reporting limits (MRL) met project-required reporting limits. The laboratory data qualifier “B” was added by the reviewer to results detected between the MDA and MRL to facilitate ADR processing.

5. Blank Sample Analysis – acceptable

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

b) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

c) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. Laboratory Control Sample Analysis (LCS) – acceptable

Recoveries of the analytes from the LCS (blank spike) samples met the acceptance criteria in use at the laboratory.

7. Matrix Spike Sample Analysis (MS) – acceptable

Analyte recoveries from the MS samples were sufficient to meet project DQOs.

8. Laboratory Duplicate Sample Analysis – acceptable

Analytical precision, estimated through duplicate sample analysis, was sufficient to achieve project data quality objectives.

9. Field Duplicate Sample Analysis – not applicable

Field duplicate samples were not submitted for analysis.

10. Sample Geometry – acceptable

All counting sources were prepared in the same geometry as the calibration standards.

11. Sample Analysis – acceptable

All laboratory deliverables were present. No discrepancies were noted.

RADIOCHEMICAL ANALYSIS – GAMMA SPECTROMETRY (EPA 901.1)

1. Timeliness – acceptable

All samples met the project-specific holding time criterion of 40 days between sample collection and analysis.

2. Initial Calibration – acceptable

The initial calibration data met the acceptance criteria specified in the analytical method.

3. Continuing Calibration Check Sample Analysis – acceptable

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. Detection Limits – acceptable

Laboratory minimum detectable activities (MDA) and method reporting limits (MRL) met project-required reporting limits. The laboratory data qualifier “B” was added by the reviewer to results detected between the MDA and MRL to facilitate ADR processing.

5. Blank Sample Analysis – acceptable

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

d) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

e) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. Laboratory Control Sample Analysis (LCS) – acceptable

Recoveries of the analytes from the LCS (blank spike) samples met the acceptance criteria in use at the laboratory.

7. Matrix Spike Sample Analysis (MS) – not applicable

Matrix spike sample analysis was not performed for this laboratory group.

8. Laboratory Duplicate Sample Analysis – *acceptable*

Analytical precision, estimated through duplicate sample analysis, was sufficient to achieve project data quality objectives.

9. Field Duplicate Sample Analysis – *not applicable*

Field duplicate samples were not submitted for analysis.

10. Sample Geometry – *acceptable*

All counting sources were prepared in the same geometry as the calibration standards.

11. Sample Analysis – *acceptable*

All laboratory deliverables were present. No other discrepancies were noted.

Laboratory Contact

No other laboratory contact was required for corrective action purposes.

Data Assessment and Reconciliation with Project Data Quality Objectives

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the collection of samples for the project.

Upon consideration of the comments and data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

Any data qualifiers applied by the laboratory have been removed from the data summary sheets and superceded by data validation qualifiers as follow:

The following qualifiers are used to modify the data quality and usefulness of individual analytical results.

- U - The compound was analyzed for, but was not detected.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the laboratory reporting limit or lowest calibration standard.

EDD Summary Report by Client Sample ID

Laboratory Reporting Batch : 545133				Laboratory : GEL			Lab Report Date : 08/09/2006		
Client Sample ID	Lab Sample ID	Analysis Method	Analysis Type	Preparation Method	Matrix	Collection Date	Receipt Date	Preparation Date	Analysis Date
TA-PA FNE	1201128362	901.1	RES		AQ	06/22/2006	06/28/2006		07/13/2006
	1201129004	DOE EML HASL-3	RES		AQ	06/27/2006	07/01/2006		07/22/2006
WS5-280606-1016	166320001	901.1	RES		AQ	06/28/2006	07/01/2006		07/13/2006
		DOE EML HASL-3	RES		AQ	06/28/2006	07/01/2006		07/22/2006
WS6-290606-0815	166320002	901.1	RES		AQ	06/29/2006	07/01/2006		07/13/2006
		DOE EML HASL-3	RES		AQ	06/29/2006	07/01/2006		07/22/2006
WS7-280606-1540	166320003	901.1	RES		AQ	06/28/2006	07/01/2006		07/13/2006
		DOE EML HASL-3	RES		AQ	06/28/2006	07/01/2006		07/22/2006
WS8-280606-1600	166320004	901.1	RES		AQ	06/28/2006	07/01/2006		07/13/2006
		DOE EML HASL-3	RES		AQ	06/28/2006	07/01/2006		07/22/2006
WS9-280606-1615	166320005	901.1	RES		AQ	06/28/2006	07/01/2006		07/13/2006
		DOE EML HASL-3	RES		AQ	06/28/2006	07/01/2006		07/22/2006

Parameter		Cesium-137		Potassium-40		Thorium-228		Thorium-230		Thorium-232	
Data		Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Beach Sediments											
SDB31-270606-0809	Bkgd	0.0423	U	20		0.399	U	0.466	U	0.446	U
SDB32-270606-0816	Bkgd	0.03	U	17.9		0.32	U	0.199	U	0.496	
SDB33-270606-0822	Bkgd	0.0435	U	19.5		0.418	U	0.296		0.329	
SDB34-270606-0830	Bkgd	0.0421	U	17.2		1.01	U	0.368	U	0.28	U
SDB35-270606-0840	Bkgd	0.0428	U	17.6		0.529	U	0.326		0.4	
SDB36-270606-0845	Bkgd	0.0432	U	21.2		0.765	U	0.559	U	0.453	U
SDB17-270606-1425		0.06	U	10.9		0.93		0.321	U	0.819	
SDB18-270606-1430		0.0567	U	10.4		2.72		0.886		3.67	
SDB20-270606-1439		0.074	U	11.5		1.24		0.654		1.33	
SDB23-270606-1451		0.0774	U	11.2		1.28		0.341		1.33	
SDB26-270606-1502		0.075	U	13.7		1.14		0.366		1.01	
SDB30-270606-1512		0.0922		15.6		0.643		0.844		0.526	
OID Sediments											
SDF11-280606-1535	Bkgd	0.0631	U	21.4		0.502	U	0.41	U	0.28	U
SDF12-280606-1545	Bkgd	0.0338	U	28.5		0.383	U	0.397	U	0.288	U
SDF13-280606-1555	Bkgd	0.0547	U	21.7		0.386	U	0.586		0.337	
SDF14-280606-1605	Bkgd	0.0404	U	23.7		1.47		0.389		1.75	
SDF15-280606-1610	Bkgd	0.0653	U	51.9		0.885		0.892		0.993	
SDF16-280606-1620	Bkgd	0.0364	U	25		0.814		0.978		0.813	
SDF10-290606-0800		0.0569	U	19.1		1.02		0.887		0.679	
SDF1-230606-1415		0.0552	U	26.3		1.31		1.33		1.08	
SDF2-230606-1535		0.0658	U	23.5		0.633		0.646		0.409	
SDF3-230606-1545		0.0403	U	19.7		1.33		0.791		0.935	
SDF4-230606-1620		0.0394	U	21.7		0.117		0.194		0.228	
SDF5-230606-1625		0.11	U	21.7		2.04		1.77		1.78	
SDF6-260606-1125		0.0458	U	18		1.06		0.661		1.09	
SDF7-280606-1505		0.12	U	22.9		1.28		1.26		1.52	
SDF8-280606-1515		0.0579	U	23.5		1.61		2.42		1.6	
SDF9-280606-1700		0.0453	U	23.1		1.56		2.43		1.58	
Marine Sediments											
SDM1-200606-1045	Bkgd	0.0767	U	25.7		0.932		0.747		1.15	
SDM2-200606-1112	Bkgd	0.0482	U	29.4		0.291		0.453		0.849	
SDM3-200606-1149	Bkgd	0.0613	U	23.8		1.05		0.489		0.674	
SDM4-200606-1400	Bkgd	0.1175	U	45.8		2.48		1.702		1.697	
SDM5-200606-1615	Bkgd	0.0544	U	23.8		0.786		0.537		0.849	
SDM6-20606-1626	Bkgd	0.0636	U	24.3		1.67		0.86		1.44	
SDM14-210606-1036		0.0413	U	24.7		1.14		0.444		1.15	
SDM16-210606-1054		0.0651	U	22.5		1.87		0.751		1.71	
SDM21-210606-1151		0.0474	U	25.1		0.382		0.55		0.296	
SDM23-210606-1318		0.0488	U	25.2		0.396		0.577		0.41	
SDM24-210606-1324		0.0582	U	23.4		0.796		0.777		0.907	
SDM26-210606-1346		0.0606	U	23.4		0.626		0.498		0.454	
Wetlands Sediments											
SWL31-210606-1720	Bkgd	0.0496	U	21.2		1.26		1.84		1.17	
SWL32-210606-1725	Bkgd	0.0728	U	45.4		0.836		0.765		0.975	
SWL33-210606-1730	Bkgd	0.0256	U	21.5		0.391	U	0.339	U	0.396	U
SWL34-210606-1735	Bkgd	0.0627		20.6		0.785		0.552		0.461	
SWL35-210606-1740	Bkgd	0.031	U	21.5		0.341		0.404		0.465	
SWL36-210606-1745	Bkgd	0.0644		22.3		0.563		0.509		0.534	

Parameter		Cesium-137	Potassium-40	Thorium-228	Thorium-230	Thorium-232
Data		Result Q	Result Q	Result Q	Result Q	Result Q
SWL13-230606-1115		0.1251 U	25.6	1.36	0.437	0.949
SWL19-230606-1212		0.0677 U	36.8	1.08	0.297 U	0.749
SWL21-230606-1411		0.0425 U	7.23	1.47	0.547	0.541
SWL22-230606-1418		0.088 U	9.67	0.879	1.38	0.806
SWL3-230606-0835		0.0469 U	8.9	2.55	1.61	2.46
SWL5-230606-0842		0.0526 U	11	1.39 U	0.826 U	0.691 U
Background Soils						
SSN94-200606-1406	Bkgd	0.0551	16.2	1.07	0.949	0.913
SSN95-200606-1433	Bkgd	0.0726	27.1	1.16	0.962	1.43
SSN96-200606-1436	Bkgd	0.0478 U	23	1.44	1.32	1.56
SSN97-200606-1440	Bkgd	0.0572 U	22.2	1.34	0.856	1.3
SSN98-200606-1447	Bkgd	0.0983 U	25.4	1.24	0.864	1.23
SSN99-200606-1452	Bkgd	0.0571 U	21.8	0.912	0.642	0.794
Residential Soils						
SSR6-270606-1649		0.0408 U	21.7	0.614	0.739	0.685
SSR8-270606-1702		0.0553 U	24	0.633	0.7	0.618
Agricultural Soils						
SSA7-260606-1420		0.0829 U	26.3	1.1	1.17	0.687
SSA8-260606-1425		0.06 U	26.6	0.833	0.889	1.12
Adjacent Soils						
SSN54-220606-1315		0.0853 U	9.85	6.33	3.25	4.73
SSN55-220606-1335		0.113	23.3	1.13	1.1	0.855
SSN58-220606-1350		0.2032 U	76.7	6.73	6.17	5.44
SSN60-220606-1400		0.0835	19.3	1.59	0.991	1.14
SSN62-220606-1410		0.0744 U	27.5	1.34	0.612	0.737
SSN74-220606-1519		0.0593 U	16	1.13 U	0.659	0.937
SSN75-220606-1524		0.0954 U	21.4	4.12	5.9	4.6
SSN86-220606-1630		0.0843 U	33.8	2.69	4.57	2.12
Smelter Soils						
SSN1/1-230606-0904		0.0313 U	13.1	2.29	2.15	3.14
SSN10/1-190606-1714		0.0574 U	22.6	0.905	0.661	0.644
SSN15-260606-0840		0.139 U	10.7	11.9	23.7	12.3
SSN2/8-230606-1005		0.249	23.6	0.555	0.371	0.596
SSN33/8-210606-1029		0.0631 U	17.4	2.66	2.35	3.2
SSN5/8-230606-1203		0.0343 U	16.9	0.479	0.544	0.52
Waste Disposal Area						
SSN35-210606-1125		0.112 U	6.26	1.66	3.16	1.52
SSN40-210606-1340		0.0336 U	9.02	0.925	0.55	0.71
SSN49-210606-1450		0.0729 U	4.22	0.358	0.244	0.258
SSN51-210606-1555		0.085 U	5.78	19.1	8.74	19.8
WMU						
SW1-1/20-240606-1720		0.0441 U	6.46	0.665 U	0.383	0.37 U
SW1-2/15-250606-1212		0.0333 U	13.6	0.973 U	0.562 U	0.472 U
SW1-4/10-250606-1028		0.0313 U	4.41	0.881 U	0.599 U	0.706 U
SW1-4/5-250606-1024		0.0776 U	4.84	0.595	0.434	0.641
SW1-5/5-250606-0941		0.0535 U	5.49	0.665 U	0.674 U	0.476 U
SW1-6/20-250606-0920		0.0478 U	5.39	0.443 U	0.47 U	0.387 U
SW1-7/15-250606-0825		0.0923 U	13.2	1.289 U	0.844 U	0.588
SW2-1/20-230606-1703		0.0516 U	28.2	1	1.17	0.831
SW2-3/15-240606-1203		0.0534 U	5.53	1.95	3.11	1.66

Parameter	Cesium-137		Potassium-40		Thorium-228		Thorium-230		Thorium-232	
Data	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
SW2-4/15-240606-0838	0.094	U	16.4		0.726	U	1.09		0.627	
SW2-5/15-240606-0926	0.125	U	55		0.626		0.569	U	0.569	U
SW2-6/20-240606-1030	0.03	U	4		1.13		0.585	U	0.836	
SW2-7/5-240606-1044	0.0791		10.1		0.625	U	0.307	U	0.412	
SW2-9/5-230606-0930	0.0996	U	50.4		0.618	U	0.817		1.01	
SW3-1/10-270606-1628	0.0925	U	2.74		0.484	U	1.38		0.495	
SW3-2/20-280606-1028	0.0518	U	6.48		1.42	U	0.888	U	0.62	U
SW3-3/10-280606-0904	0.0708	U	7.81		0.337	U	0.857		0.184	
SW3-4/5-270606-1523	0.0549	U	6.19		0.69		0.483		0.46	
SW3-5/20-270606-1415	0.0969	U	7.39		0.947	U	0.563	U	0.563	U
SW3-6/10-270606-1309	0.0485	U	7.06		0.509	U	0.478		0.116	
SW3-7/20-270606-1230	0.039	U	7.12		0.476	U	0.33		0.452	
SW3-9/10-270606-1100	0.0741	U	7.23		0.666	U	0.621	U	0.531	U
SW4-1/5-220606-1545	0.0364	U	1.91		0.982	U	0.299	U	0.299	U
SW4-3/5-240606-1537	0.0655	U	7.28		0.435	U	0.308	U	0.223	U
SW4-4/10-220606-1255	0.0541	U	9		0.457	U	0.274		0.273	U
SW4-5/20-220606-1355	0.0631	U	7.17		4.48		5.25		4.79	
SW4-6/20-270606-0945	0.0509	U	5.16		0.767		0.67		0.474	U
SW4-7/15-270606-0845	0.0676	U	2.11		0.667	U	0.929		0.465	
SW5-1/5-260606-1046	0.025	U	19.2		0.533	U	0.435	U	0.298	U
SW5-2/15-260606-1012	0.0342	U	5.78		0.572	U	0.592	U	0.43	U
SW5-3/20-260606-0935	0.0356	U	7.23		0.635	U	0.361	U	0.289	U
SW5-4/15-260606-0851	0.0792	U	4.97		0.605	U	0.41		0.301	
SW5-5/5-260606-1130	0.0512	U	2.53		0.526	U	0.32	U	0.202	U
SW5-6/5-260606-1414	0.0661	U	4.1		0.651	U	0.322	U	0.233	U
SW5-7/10-260606-1708	0.094	U	3.39		0.647	U	0.453	U	0.15	
SW5-9/15-260606-0945	0.0493	U	19.4		0.52	U	0.259	U	0.812	
Smelter Waste										
SWF1-260606-1242	0.0778	U	22.3		0.35	U	0.473		0.181	U
SWF5-260606-1325	0.0583	U	15.8		0.685	U	0.373	U	0.118	U

Appendix H-8: STLC Metals

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

Laboratory: EMAX Laboratories	Lab Project Number: 06F310
Sampling Dates: 6/22, 24, 26, & 27/06	Sample Matrix: Solid
Analytical Method:STLC METALS (6010B/7470A)	Data Reviewer: M.Song

REVIEW AND APPROVAL:

Data Reviewer: Mindy Song
Technical QA Reviewer: Mike Schwennesen
Project Manager: Caren Welch

Date: _____
Date: _____
Date: _____

SAMPLE IDENTIFICATION:

Sample No.	Sample I.D.	Laboratory I.D.
1	SW3-6/10-270606-1309	F310-01
2	SW3-7/20-270605-1230	F310-02
3	SW3-9/10-270606-1100	F310-03
4	SW4-1/5-220606-1545	F310-04
5	SW4-2/5-220606-1655	F310-05
6	SW4-3/5-240606-1537	F310-06
7	SW4-4/10-220606-1255	F310-07
8	SW4-5/20-220606-1355	F310-08
9	SW4-6/20-270606-0945	F310-09
10	SW4-7/15-270606-0845	F310-10
11	SW5-1/5-260606-1046	F310-11
12	SW5-2/15-260606-1012	F310-12
13	SW5-3/20-260606-0935	F310-13
14	SW5-4/15-260606-0851	F310-14
15	SW5-5/5-260606-1130	F310-15
16	SW5-6/5-260606-1414	F310-16
17	SW5-7/10-260606-1708	F310-17
18	SW5-9/15-260606-0945	F310-18
19		

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

TA PACKAGE COMPLETENESS CHECKLIST:

Checklist Code:

<u> X </u>	Included: no problems
<u> * </u>	Included: problems noted in review
<u> O </u>	Not Included and/or Not Available
<u> NR </u>	Not Required
<u> RS </u>	Provided As Re-submission

Case Narrative:

<u> X </u>	Case Narrative present
--------------	------------------------

Quality Control Summary Package:

<u> X </u>	Data Summary sheets
<u> X </u>	Initial and Continuing Calibration results
<u> NR </u>	CRDL Standard results
<u> * </u>	Preparation Blank and Calibration Blank results
<u> X </u>	ICP Interference Check Sample results
<u> X </u>	Matrix Spike recoveries
<u> X </u>	Matrix Duplicate results
<u> X </u>	Laboratory Control Sample recoveries
<u> NR </u>	Method of Standard Additions results
<u> X </u>	ICP Serial Dilution results
<u> NR </u>	Instrument Detection Limits
<u> NR </u>	ICP Interelement Correction Factors
<u> NR </u>	ICP Linear Ranges
<u> X </u>	Preparation Log
<u> X </u>	Analysis Run Log

Raw QC Data Package Section

<u> X </u>	Chain-of-Custody Records
<u> X </u>	Instrument Printouts
<u> X </u>	Sample Preparation Notebook Pages
<u> X </u>	Logbook and Worksheet Pages
<u> NR </u>	Percent Solids Determination

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

DATA VALIDATION SUMMARY

The data were reviewed following procedures and limits specified in the EPA OSWER directive, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (EPA/540/G-90/004, OSWER Directive 9360.4-01, dated April 1990).

Indicate with a YES or NO whether each item is acceptable without qualification:

1	Holding Times	YES
2	Initial and Continuing Calibrations	YES
3	Laboratory Control Sample	YES
4	Matrix Spike	YES
5	Blanks and Background Samples	YES
6	Duplicate Analyses	YES
7	Interference Check Samples and Serial Dilution Analysis	YES
8	Post Digestion Spike and Standard Addition Analysis	YES
9	Analyte Quantitation	YES
10	Overall Assessment of Data	YES
11	Usability of Data	YES

Comments: Eighteen soil samples were analyzed for STLC Metals and no data were qualified from this SDG.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

1. HOLDING TIMES

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable

Samples were extracted and analyzed within required holding times except as noted under Comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those samples analyzed outside holding time requirements, the detected results have been qualified as estimated (J), and the nondetected results have been qualified either as estimated (UJ) or rejected (R) based on the reviewer's judgement.

All Sample Matrices:

Mercury: 28 days (from collection) for analysis.

Hexavalent chromium: 24 hours (from collection) for analysis.

All other metals: 180 days (from collection) for analysis.

Comments: Analysis met holding time criteria.

2. INITIAL AND CONTINUING CALIBRATION VERIFICATION

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable

Unless flagged below, an initial calibration verification (ICV) and a calibration blank were analyzed at the beginning of the run, and a continuing calibration verification (CCV) and a calibration blank were analyzed after every ten samples, and at the end of the run. ICV and CCV recoveries were within a range of 80-120% for mercury and tin, and 90-110% for all other metals. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the recovery was below 65% or above 135% (for mercury and tin) or below 75% or above 125% (for all other metals), all associated data are rejected (R).

Comments: All recoveries of initial and continuing calibration verification were within the control limits.

Appendix H-9: Fish Tissue Metals




Weston Solutions, Inc.
Suite 200
190 Queen Anne Avenue North
Seattle, Washington 98109-4926
206-521-7600 Fax 206-521-7601
www.westonsolutions.com

MEMORANDUM

DATE: 18 September 2006

TO: Ben Castellana, Ph.D., Weston Solutions, Sherman Oaks

FROM: Paul Swift, Ph.D., Weston Solutions, Seattle 

SUBJECT: Review and Validation Metals Data
Laboratory Group: FISH01
Site: Halaco Engineering Company, Oxnard, California
Project: Integrated Assessment

CONTRACT: GSA W91238-05-F-0052

WORK ORDER: 12767.062.317.5000

cc: Weston Solutions project file

The quality assurance review and validation of analytical results from 9 fish samples, laboratory group **FISH01**, collected from the Halaco Engineering Company site, 6200 Perkins Road, Oxnard, Ventura County, California between 26 June and 29 June, 2006 has been completed. The whole fish tissue samples were analyzed for CLP Target Analyte List (TAL) metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc) by Laucks Testing Laboratories, Inc., of Seattle, Washington.

Samples were prepared following EPA Method 200.3, acid digestion of biological matrices, and analyzed following EPA Method 6020A, inductively-coupled plasma – mass spectrometry (ICP-MS).

The samples were numbered:

FISH1-260606-0930	FISH2-260606-0930	FISH3-260606-1130	FISH4-260606-1500
FISH5-260606-1500	FISH6-280606-1130	FISH7-280606-1440	FISH9-280606-1500
FISH10-290606-0930			

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the individual analytical methods. The review follows the format described in the *National Functional Guidelines for Inorganic Data Review* (USEPA 2004) and specific procedural details provided in the individual analytical methods and the analytical laboratory's standard operating procedures.

Data validation was performed to assess overall data quality and usability relative to project data quality objectives (DQOs) specified in the project Quality Assurance Project Plan (QAPP).

METALS ANALYSIS (SW846 6020A)

1. **Timeliness** – *acceptable*

All samples met holding time criteria of 180 days for the initial sample analysis.

2. **Initial Calibration** – *acceptable*

The initial calibration data met the acceptance criteria specified in the analytical method.

3. **Continuing Calibration Check Sample Analysis** – *acceptable*

The continuing calibration check sample analysis results met the criteria specified in the analytical method.

4. **Detection Limits** – *acceptable*

Laboratory method detection limits (MDL) and reporting limits met project-required reporting limits.

5. **Blank Sample Analysis** – *acceptable*

a) Laboratory Method Blanks

Laboratory method blank frequency and recovery criteria were met.

b) Laboratory Instrument Blanks

Project DQOs were not negatively affected by any laboratory blank detections.

c) Field / Equipment Blanks

No field blanks were associated with this analytical group.

6. Laboratory Control Sample Analysis (LCS) – *acceptable*

Recovery of the analytes from the LCS (blank spike) samples met the acceptance criteria in use at the laboratory.

7. Matrix Spike and Matrix Spike Duplicate Sample Analysis (MS/MSD) – *acceptable*

Analyte recoveries from the MS/MSD samples were sufficient to meet project DQOs.

8. Laboratory Duplicate Sample Analysis – *not applicable*

Duplicate sample analysis was not performed for this sample delivery group.

9. Field Duplicate Sample Analysis – *not applicable*

Field duplicate samples were not submitted for analysis.

10. Serial Dilution Analysis

Serial dilution percent difference determinations met method acceptance criteria, with the following exception.

Serial dilution percent difference for barium (22.3%) and selenium (18.9%) exceeded the acceptance criterion of 10 percent as specified in the analytical method. Both barium and selenium were detected in all samples, and the associated results were qualified as estimated concentrations (J), unknown bias (K).

11. Interference Check Sample Analysis – *acceptable*

All interference check sample analyses met method acceptance criteria.

12. Sample Analysis – *acceptable*

All laboratory deliverables were present. No discrepancies were noted.

Laboratory Contact

No laboratory contact was required for corrective action purposes.

Data Assessment and Reconciliation with Project Data Quality Objectives

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the collection of samples for the project.

Upon consideration of the comments and data qualifications noted above and the project data quality objectives specified in the QAPP, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

Any data qualifiers applied by the laboratory have been removed from the data summary sheets and superceded by data validation qualifiers as follow:

The following qualifiers are used to modify the data quality and usefulness of individual analytical results.

- U - The compound was analyzed for, but was not detected.
- J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the laboratory reporting limit or lowest calibration standard.
- K - Unknown bias.

Laucks

Testing Laboratories, Inc.

940 South Harney St.
Seattle, WA 98108
(206) 767-5060 FAX (206) 767-5063

FAX/Email Cover Sheet

To: Ben Castellana / Paul Swift FAX/Email: CWSTONSOLUTIONS.COM
Company: Weston Solutions Date: 15 Aug 2006
From: Michael Baxter No. of Pages
(including cover
page): 10

Preliminary Results for:

SDG (s): FISH#1

Analysis: 6020 TAh List Metals (no Mercury)

Verified by: BA

Do these samples need to be re-analyzed?

Yes

No

If yes, which samples?: _____

Reason: _____

The preliminary results for the re-analysis will be faxed on (date): _____

Laucks does not certify that these results meet NELAC Standards because all NELAC required elements are not included in the facsimile. Please refer to the full report to review all NELAC required elements.

The information contained in or attached to this FAX message is intended only for the confidential use of the individual(s) named above. If you are not the named recipient, or an agent responsible for delivering it to the named recipient, you are hereby notified that you have received this document in error, and that review, dissemination, or copying of this communication is prohibited. If you have received this communication in error, please notify us immediately by telephone at 206-767-5060, and return the original documents to us by mail at the address listed above.

INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH1-260606-0930

Lab Name: Laucks Laboratories

Contract: _____

Lab Code: LAUCKSSDG No.: FISH01Matrix (soil/water): SoilLab Sample ID: FISH01-001Level (low/med): LOWDate Received: 07/22/2006% Solids: 100Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	5.3	B		M	R009587
7440-36-0	Antimony	0.048	B		M	R009587
7440-38-2	Arsenic	0.51			M	R009587
7440-39-3	Barium	0.45			M	R009587
7440-41-7	Beryllium	0.042	B		M	R009587
7440-43-9	Cadmium	0.084	B		M	R009587
7440-70-2	Calcium	12400			M	R009600
7440-47-3	Chromium	0.081	B		M	R009587
7440-48-4	Cobalt	0.045	B		M	R009587
7440-50-8	Copper	2.1			M	R009587
7439-89-6	Iron	17.9			M	R009587
7439-92-1	Lead	0.061	B		M	R009587
7439-95-4	Magnesium	516			M	R009587
7439-96-5	Manganese	2.6			M	R009587
7440-02-0	Nickel	0.081	B		M	R009587
7440-09-7	Potassium	3240			M	R009587
7782-49-2	Selenium	0.74			M	R009587
7440-22-4	Silver	0.066	B		M	R009587
7440-23-5	Sodium	1000			M	R009587
7440-28-0	Thallium	0.040	B		M	R009587
7440-62-2	Vanadium	0.12	B		M	R009587
7440-66-6	Zinc	35.7			M	R009587

Color Before: Black Clarity Before: _____ Texture: _____Color After: Grey Clarity After: _____ Artifacts: No

Comment _____

INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH2-260606-0930

Lab Name: Laucks Laboratories

Contract: _____

Lab Code: LAUCKSSDG No.: FISH01Matrix (soil/water): SoilLab Sample ID: FISH01-002Level (low/med): LOWDate Received: 07/22/2006% Solids: 100Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	5.3	B		M	R009587
7440-36-0	Antimony	0.026	B		M	R009587
7440-38-2	Arsenic	0.51			M	R009587
7440-39-3	Barium	0.44			M	R009587
7440-41-7	Beryllium	0.021	B		M	R009587
7440-43-9	Cadmium	0.037	B		M	R009587
7440-70-2	Calcium	12000			M	R009600
7440-47-3	Chromium	0.042	B		M	R009587
7440-48-4	Cobalt	0.027	B		M	R009587
7440-50-8	Copper	1.2			M	R009587
7439-89-6	Iron	17.1			M	R009587
7439-92-1	Lead	0.038	B		M	R009587
7439-95-4	Magnesium	497			M	R009587
7439-96-5	Manganese	2.9			M	R009587
7440-02-0	Nickel	0.059	B		M	R009587
7440-09-7	Potassium	3120			M	R009587
7782-49-2	Selenium	0.76			M	R009587
7440-22-4	Silver	0.033	B		M	R009587
7440-23-5	Sodium	999			M	R009587
7440-28-0	Thallium	0.017	B		M	R009587
7440-62-2	Vanadium	0.093	B		M	R009587
7440-66-6	Zinc	34.7			M	R009600

Color Before: Black Clarity Before: _____ Texture: _____Color After: Grey Clarity After: _____ Artifacts: No

Comment _____

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-1-
INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH3-260606-1130

Lab Name: Laucks Laboratories

Contract: _____

Lab Code: LAUCKS

SDG No.: FISH01

Matrix (soil/water): Soil

Lab Sample ID: FISH01-003

Level (low/med): LOW

Date Received: 07/22/2006

% Solids: 100

Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	10.9			M	R009587
7440-36-0	Antimony	0.026	B		M	R009587
7440-38-2	Arsenic	0.31			M	R009587
7440-39-3	Barium	0.52			M	R009587
7440-41-7	Beryllium	0.026	B		M	R009587
7440-43-9	Cadmium	0.041	B		M	R009587
7440-70-2	Calcium	7260			M	R009600
7440-47-3	Chromium	0.076	B		M	R009587
7440-48-4	Cobalt	0.026	B		M	R009587
7440-50-8	Copper	0.77			M	R009587
7439-89-6	Iron	17.3			M	R009587
7439-92-1	Lead	0.064	B		M	R009587
7439-95-4	Magnesium	391			M	R009587
7439-96-5	Manganese	5.5			M	R009587
7440-02-0	Nickel	1.0			M	R009587
7440-09-7	Potassium	3220			M	R009587
7782-49-2	Selenium	0.81			M	R009587
7440-22-4	Silver	0.025	B		M	R009587
7440-23-5	Sodium	1200			M	R009587
7440-28-0	Thallium	0.027	B		M	R009587
7440-62-2	Vanadium	0.064	B		M	R009587
7440-66-6	Zinc	21.1			M	R009587

Color Before: Black Clarity Before: _____ Texture: _____

Color After: Grey Clarity After: _____ Artifacts: No

Comment _____

INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH4-260606-1500

Lab Name: Laucks Laboratories

Contract: _____

Lab Code: LAUCKSSDG No.: FISH01Matrix (soil/water): SoilLab Sample ID: FISH01-004Level (low/med): LOWDate Received: 07/22/2006% Solids: 100Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	10.7	B		M	R009587
7440-36-0	Antimony	0.014	B		M	R009587
7440-38-2	Arsenic	0.31			M	R009587
7440-39-3	Barium	1.2			M	R009587
7440-41-7	Beryllium	0.014	B		M	R009587
7440-43-9	Cadmium	0.061	B		M	R009587
7440-70-2	Calcium	25900			M	R009600
7440-47-3	Chromium	0.051	B		M	R009587
7440-48-4	Cobalt	0.025	B		M	R009587
7440-50-8	Copper	3.9			M	R009587
7439-89-6	Iron	29.8			M	R009587
7439-92-1	Lead	0.069	B		M	R009587
7439-95-4	Magnesium	678			M	R009587
7439-96-5	Manganese	7.8			M	R009587
7440-02-0	Nickel	0.076	B		M	R009587
7440-09-7	Potassium	2990			M	R009587
7782-49-2	Selenium	0.73			M	R009587
7440-22-4	Silver	0.043	B		M	R009587
7440-23-5	Sodium	1550			M	R009587
7440-28-0	Thallium	0.0079	B		M	R009587
7440-62-2	Vanadium	0.32	B		M	R009587
7440-66-6	Zinc	46.4			M	R009600

Color Before: Black Clarity Before: _____ Texture: _____Color After: Grey Clarity After: _____ Artifacts: No

Comment _____

SW-846
-1-
INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH5-260606-1500

Lab Name: Laucks Laboratories

Contract: _____

Lab Code: LAUCKS

SDG No.: FISH01

Matrix (soil/water): Soil

Lab Sample ID: FISH01-005

Level (low/med): LOW

Date Received: 07/22/2006

% Solids: 100

Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	8.7	B		M	R009587
7440-36-0	Antimony	0.0085	B		M	R009587
7440-38-2	Arsenic	0.21	B		M	R009587
7440-39-3	Barium	0.66			M	R009587
7440-41-7	Beryllium	0.0075	B		M	R009587
7440-43-9	Cadmium	0.021	B		M	R009587
7440-70-2	Calcium	5690			M	R009600
7440-47-3	Chromium	0.22			M	R009587
7440-48-4	Cobalt	0.013	B		M	R009587
7440-50-8	Copper	1.5			M	R009587
7439-89-6	Iron	20.6			M	R009587
7439-92-1	Lead	0.053	B		M	R009587
7439-95-4	Magnesium	268			M	R009587
7439-96-5	Manganese	2.9			M	R009587
7440-02-0	Nickel	0.061	B		M	R009587
7440-09-7	Potassium	2250			M	R009587
7782-49-2	Selenium	0.51			M	R009587
7440-22-4	Silver	0.012	B		M	R009587
7440-23-5	Sodium	857			M	R009587
7440-28-0	Thallium	0.0028	U		M	R009587
7440-62-2	Vanadium	0.079	B		M	R009587
7440-66-6	Zinc	12.4			M	R009587

Color Before: Black Clarity Before: _____ Texture: _____

Color After: Grey Clarity After: _____ Artifacts: No

Comment: _____

INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH6-280606-1130

Lab Name: Laucks Laboratories

Contract: _____

Lab Code: LAUCKSSDG No.: FISH01Matrix (soil/water): SoilLab Sample ID: FISH01-006Level (low/med): LOWDate Received: 07/22/2006% Solids: 100Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	15.5			M	R009587
7440-36-0	Antimony	0.061	B		M	R009587
7440-38-2	Arsenic	0.40			M	R009587
7440-39-3	Barium	0.76			M	R009587
7440-41-7	Beryllium	0.0061	B		M	R009587
7440-43-9	Cadmium	0.023	B		M	R009587
7440-70-2	Calcium	12700			M	R009600
7440-47-3	Chromium	0.061	B		M	R009587
7440-48-4	Cobalt	0.016	B		M	R009587
7440-50-8	Copper	1.1			M	R009587
7439-89-6	Iron	38.1			M	R009587
7439-92-1	Lead	0.053	B		M	R009587
7439-95-4	Magnesium	516			M	R009587
7439-96-5	Manganese	4.8			M	R009587
7440-02-0	Nickel	0.066	B		M	R009587
7440-09-7	Potassium	2970			M	R009587
7782-49-2	Selenium	0.68			M	R009587
7440-22-4	Silver	0.016	B		M	R009587
7440-23-5	Sodium	1060			M	R009587
7440-28-0	Thallium	0.0029	U		M	R009587
7440-62-2	Vanadium	0.13	B		M	R009587
7440-66-6	Zinc	33.0			M	R009587

Color Before: Black Clarity Before: _____ Texture: _____Color After: Grey Clarity After: _____ Artifacts: No

Comment _____

INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH7-280606-1440

Lab Name: Laucks Laboratories

Contract: _____

Lab Code: LAUCKSSDG No.: FISH01Matrix (soil/water): SoilLab Sample ID: FISH01-007Level (low/med): LOWDate Received: 07/22/2006% Solids: 100Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	3.5	B		M	R009587
7440-36-0	Antimony	0.0063	U		M	R009587
7440-38-2	Arsenic	0.38			M	R009587
7440-39-3	Barium	0.68			M	R009587
7440-41-7	Beryllium	0.0035	U		M	R009587
7440-43-9	Cadmium	0.091	B		M	R009587
7440-70-2	Calcium	12200			M	R009600
7440-47-3	Chromium	0.023	B		M	R009587
7440-48-4	Cobalt	0.011	B		M	R009587
7440-50-8	Copper	3.4			M	R009587
7439-89-6	Iron	16.8			M	R009587
7439-92-1	Lead	0.024	B		M	R009587
7439-95-4	Magnesium	551			M	R009587
7439-96-5	Manganese	4.0			M	R009587
7440-02-0	Nickel	0.049	B		M	R009587
7440-09-7	Potassium	1490			M	R009587
7782-49-2	Selenium	0.40			M	R009587
7440-22-4	Silver	0.027	B		M	R009587
7440-23-5	Sodium	1300			M	R009587
7440-28-0	Thallium	0.0029	U		M	R009587
7440-62-2	Vanadium	0.17	B		M	R009587
7440-66-6	Zinc	40.3			M	R009587

Color Before: Black Clarity Before: _____ Texture: _____Color After: Grey Clarity After: _____ Artifacts: No

Comment _____

SW-846
-1-
INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH9-280606-1500

Lab Name: Laucks Laboratories Contract: _____
 Lab Code: LAUCKS SDG No.: FISH01
 Matrix (soil/water): Soil Lab Sample ID: FISH01-008
 Level (low/med): LOW Date Received: 07/22/2006
 % Solids: 100

Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	2.6	B		M	R009587
7440-36-0	Antimony	0.018	B		M	R009587
7440-38-2	Arsenic	0.19	B		M	R009587
7440-39-3	Barium	0.47			M	R009587
7440-41-7	Beryllium	0.0034	U		M	R009587
7440-43-9	Cadmium	0.017	B		M	R009587
7440-70-2	Calcium	12600			M	R009600
7440-47-3	Chromium	0.033	B		M	R009587
7440-48-4	Cobalt	0.0074	B		M	R009587
7440-50-8	Copper	1.2			M	R009587
7439-89-6	Iron	11.8			M	R009587
7439-92-1	Lead	0.016	B		M	R009587
7439-95-4	Magnesium	464			M	R009587
7439-96-5	Manganese	9.8			M	R009587
7440-02-0	Nickel	0.051	B		M	R009587
7440-09-7	Potassium	3520			M	R009587
7782-49-2	Selenium	0.84			M	R009587
7440-22-4	Silver	0.0098	B		M	R009587
7440-23-5	Sodium	1460			M	R009587
7440-28-0	Thallium	0.0028	U		M	R009587
7440-62-2	Vanadium	0.069	B		M	R009587
7440-66-6	Zinc	29.2			M	R009587

Color Before: Black Clarity Before: _____ Texture: _____
 Color After: Grey Clarity After: _____ Artifacts: No
 Comment _____

SW-846
-1-
INORGANIC ANALYSES DATA SHEET

SAMPLE NO.

FISH10-290606-0930

Lab Name: Laucks Laboratories

Contract: _____

Lab Code: LAUCKS

SDG No.: FISH01

Matrix (soil/water): Soil

Lab Sample ID: FISH01-009

Level (low/med): LOW

Date Received: 07/22/2006

% Solids: 100

Concentration Units : mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	Run Seq.
7429-90-5	Aluminum	66.5			M	R009587
7440-36-0	Antimony	0.033	B		M	R009587
7440-38-2	Arsenic	0.43			M	R009587
7440-39-3	Barium	0.99			M	R009587
7440-41-7	Beryllium	0.0066	B		M	R009587
7440-43-9	Cadmium	0.019	B		M	R009587
7440-70-2	Calcium	11200			M	R009600
7440-47-3	Chromium	0.12	B		M	R009587
7440-48-4	Cobalt	0.021	B		M	R009587
7440-50-8	Copper	2.2			M	R009587
7439-89-6	Iron	37.1			M	R009587
7439-92-1	Lead	0.16	B		M	R009587
7439-95-4	Magnesium	448			M	R009587
7439-96-5	Manganese	9.3			M	R009587
7440-02-0	Nickel	0.50			M	R009587
7440-09-7	Potassium	3660			M	R009587
7782-49-2	Selenium	1.1			M	R009587
7440-22-4	Silver	0.0041	B		M	R009587
7440-23-5	Sodium	1530			M	R009587
7440-28-0	Thallium	0.0027	U		M	R009587
7440-62-2	Vanadium	0.12	B		M	R009587
7440-66-6	Zinc	33.7			M	R009587

Color Before: Black Clarity Before: _____ Texture: _____

Color After: Grey Clarity After: _____ Artifacts: No

Comment _____

Appendix H-10: Air Filter Metals

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

Laboratory: EMAX Laboratories	Lab Project Number: 06F308
Sampling Dates: 6/20/06 thru 6/26/06	Sample Matrix: Air Filter
Analytical Method: METALS (6010B/7471A)	Data Reviewer: M.Song

REVIEW AND APPROVAL:

Data Reviewer: Mindy Song
Technical QA Reviewer: Mike Schwennesen
Project Manager: Caren Welch

Date: _____
Date: _____
Date: _____

SAMPLE IDENTIFICATION:

Sample No.	Sample I.D.	Laboratory I.D.
1	AIR-1-200606-1750	F308-01
2	AIR-2-200606-1738	F308-02
3	AIR-3-200606-1743	F308-03
4	AIR-4-200606-1800	F308-04
5	AIR-5-200606-1809	F308-05
6	AIR-1-210606-1721	F308-06
7	AIR-2-210606-1727	F308-07
8	AIR-3-210606-1733	F308-08
9	AIR-4-210606-1740	F308-09
10	AIR-5-210606-1747	F308-10
11	AIR-6-210606-1729	F308-11
12	AIR-1-220606-1719	F308-12
13	AIR-2-220606-1725	F308-13
14	AIR-3-220606-1730	F308-14
15	AIR-4-220606-1736	F308-15
16	AIR-5-220606-1741	F308-16
17	AIR-6-220606-1728	F308-17
18	AIR-1-230606-1703	F308-18
19	AIR-6-230606-1658	F308-19
20	AIR-1-240606-1741	F308-20

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

Sample No.	Sample I.D.	Laboratory I.D.
21	AIR-2-240606-1752	F308-21
22	AIR-1-260606-1317	F308-22
23	AIR-2-260606-1310	F308-23
24	AIR-4-260606-1259	F308-24
25	BLANK FILTER	F308-25

DATA PACKAGE COMPLETENESS CHECKLIST:

Checklist Code:

- X Included: no problems
- * Included: problems noted in review
- O Not Included and/or Not Available
- NR Not Required
- RS Provided As Re-submission

Case Narrative:

- X Case Narrative present

Quality Control Summary Package:

- X Data Summary sheets
- X Initial and Continuing Calibration results
- NR CRDL Standard results
- * Preparation Blank and Calibration Blank results
- X ICP Interference Check Sample results
- O Matrix Spike recoveries
- O Matrix Duplicate results
- * Laboratory Control Sample recoveries
- NR Method of Standard Additions results
- X ICP Serial Dilution results
- NR Instrument Detection Limits
- NR ICP Interelement Correction Factors
- NR ICP Linear Ranges
- X Preparation Log
- X Analysis Run Log

Raw QC Data Package Section

- X Chain-of-Custody Records
- X Instrument Printouts
- X Sample Preparation Notebook Pages
- X Logbook and Worksheet Pages
- NR Percent Solids Determination

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

DATA VALIDATION SUMMARY

The data were reviewed following procedures and limits specified in the EPA OSWER directive, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (EPA/540/G-90/004, OSWER Directive 9360.4-01, dated April 1990).

Indicate with a YES or NO whether each item is acceptable without qualification:

1	Holding Times	YES
2	Initial and Continuing Calibrations	YES
3	Laboratory Control Sample	NO
4	Matrix Spike	NA
5	Blanks and Background Samples	NO
6	Duplicate Analyses	YES
7	Interference Check Samples and Serial Dilution Analysis	YES
8	Post Digestion Spike and Standard Addition Analysis	N/A
9	Analyte Quantitation	YES
10	Overall Assessment of Data	YES
11	Usability of Data	YES

Comments: N/A: Not Applicable. NA: Not Analyzed

Twenty five air filter samples were analyzed for CAM Metals by EPA 6010B/7471A.

Percent recoveries of LCS except Barium and Zinc were within the control limits.

Detected Barium and Zinc results were qualified as estimated (J). Blank Filter was submitted for analysis. Trace level of Sb, As, Co, Cu, Pb, Ni and Tl were detected but Ba, Cr, V, & Zn were found at above the reporting limit. These metals detected in the samples were qualified as non-detect (U) when the sample concentration is less than 5X the blank concentration.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

1. HOLDING TIMES

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable

Samples were extracted and analyzed within required holding times except as noted under Comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those samples analyzed outside holding time requirements, the detected results have been qualified as estimated (J), and the nondetected results have been qualified either as estimated (UJ) or rejected (R) based on the reviewer's judgement.

All Sample Matrices:

Mercury: 28 days (from collection) for analysis.

Hexavalent chromium: 24 hours (from collection) for analysis.

All other metals: 180 days (from collection) for analysis.

Comments: All holding times were met.

2. INITIAL AND CONTINUING CALIBRATION VERIFICATION

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable

Unless flagged below, an initial calibration verification (ICV) and a calibration blank were analyzed at the beginning of the run, and a continuing calibration verification (CCV) and a calibration blank were analyzed after every ten samples, and at the end of the run. ICV and CCV recoveries were within a range of 80-120% for mercury and tin, and 90-110% for all other metals. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the recovery was below 65% or above 135% (for mercury and tin) or below 75% or above 125% (for all other metals), all associated data are rejected (R).

Comments: All recoveries of metals in initial and continuing calibration verifications were within the control limits.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

3. LABORATORY CONTROL SAMPLE

☐ Acceptable
☒ Acceptable with qualification
☐ Unacceptable
☐ No Laboratory Control Samples Analyzed

Laboratory control sample recoveries are used for a qualitative indication of accuracy (bias) independent of matrix effects. LCS recovery limits should either be specified in the Sampling and Analysis Plan or can be established by the laboratory. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J).

In cases where the recovery was below 30%, all associated nondetected results are rejected (R) and detected results are qualified as estimated (J).

Comments: Percent recoveries of LCS except Barium and Zinc were within the control limits. Detected Barium and Zinc results were qualified as estimated (J).

4. MATRIX SPIKE

☐ Acceptable
☐ Acceptable with qualification
☐ Unacceptable
☒ No Matrix Spikes Analyzed

Matrix spike recoveries are used for a qualitative indication of accuracy (bias) due to matrix effects. Unless flagged below, one laboratory control sample was analyzed at a rate of one per batch or one per 20 samples. Recoveries were within a range of 75-125%.

For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the recovery was below 30%, all associated nondetected results are rejected (R) and detected results are qualified as estimated (J).

Comments: No sample was designated for matrix spike and matrix spike duplicate but LCS and LCD were analyzed instead.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

5. BLANKS AND BACKGROUND SAMPLES

☐ Acceptable
☒ Detection Limits Adjusted

The following blanks were analyzed:

☒ Method (preparation) Blanks
☐ Field Blanks
☐ Calibration Blanks
☐ Rinsate Blanks
☐ Background Samples

Preparation (method) blanks were prepared for each batch of samples extracted. A preparation blank was analyzed after every continuing calibration standard, prior to sample analysis unless noted below. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (U) when the sample concentration is less than 5x the blank concentration.

Comments: Blank Filter was submitted for analysis. Trace level of Sb, As, Co, Cu, Pb, Ni and Tl were detected but Ba, Cr, V, & Zn were found at above the reporting limit. These metals detected in the samples were qualified as non-detect (U) when the sample concentration is less than 5X the blank concentration.

6. DUPLICATE ANALYSES

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable
☐ No Duplicates Analyzed

Type of duplicates analyzed:

☐ Field Duplicates
☒ Laboratory Duplicates

Calculate the relative Percent Difference (RPD) between the members of duplicate pairs using the equation indicated below. Qualify the detected results as estimated (J) for any analyte whose RPD in a laboratory duplicate exceeds 20% for water samples or 35% for soil samples.

$$RPD = \frac{2(\text{Value 1} - \text{Value 2})}{\text{Value 1} + \text{Value 2}} \times 100\%$$

Comments: RPDs of LCS & LCD <35%.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

7. INTERFERENCE CHECK SAMPLES AND SERIAL DILUTION ANALYSIS

- ☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable
☐ Not required

Interference Check Samples (ICS) - Unless flagged below, an ICS was analyzed at the beginning and end of each run and at least twice every eight hours. Recoveries were within a range of 80-120%. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J) if the concentrations of Al, Ca, Fe, or Mg are higher in the sample than in the ICS.

Serial Dilution Analysis - Unless flagged below, a serial dilution analysis was performed at a rate of one per 20 samples on a sample having analyte concentrations greater than 50 times the IDL. Percent differences were within a range of 0-10%. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J).

Comments: ICS recoveries were within the control limit.

Sample AIR-1-200606-1750 was used for serial dilution and analytical spike and QC requirements were met.

8. POST DIGESTION SPIKE AND STANDARD ADDITIONS

- ☐ Acceptable
☐ Acceptable with qualification
☐ Unacceptable
☒ Not required

Post-digestion spikes - If a furnace AA result was flagged by the laboratory with an E to indicate interference, and the associated post-digestion spike recovery was less than 10%, the associated results are rejected (R).

Method of Standard Additions - If the method of standard additions was required and the correlation coefficient was less than 0.995, the associated results were qualified as estimated (J).

Comments:

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

9. ANALYTE QUANTITATION

Confirm that analyte quantitation was performed correctly using the following formulas:

Water samples:

$$\text{ug/L} = \frac{(\text{Instrument printout concentration, mg/L})(1000 \text{ ug/mg})(\text{final volume of extract, mL})}{(\text{Initial volume of extract, mL})}$$

Soil samples:

$$\text{mg/kg} = \frac{(\text{Instrument printout concentration, mg/L})(\text{final volume of extract, mL})(0.001 \text{ L/mL})}{(\text{weight of sample extracted, g})(0.001 \text{ kg/g})(\text{fraction solids})}$$

Comments: Analyte quantitation is acceptable. Laboratory reported results in ug/filter and ng/ft3. Sample AIR-1-200606-1750 (4901.175 ft3)

Ba: (12850ug/L) (0.1L/filter) = 1285ug/filter. Lab reported 1290ug/filter.

(1285ug) (1000ng/ug) / (4901.175 ft3) = 262.2ng/ft3. Lab reported 262ng/ft3.

Cr: (84.80ug/L) (0.1L/filter) = 8.48ug/filter. Lab reported 8.48ug/filter.

(8.48ug) (1000ng/ug) / (4901.175 ft3) = 1.73ng/ft3. Lab reported 1.73ng/ft3.

Zn: (8946ug/L) (0.1L/filter) = 894.6ug/filter. Lab reported 895ug/filter.

(894.6ug) (1000ng/ug) / (4901.175 ft3) = 182.5ng/ft3. Lab reported 183ng/ft3.

Sample AIR-2-240606-1752 (4617.6 ft3)

Ba: (13510ug/L) (0.1L/filter) = 1351ug/filter. Lab reported 1350ug/filter.

(1351ug) (1000ng/ug) / (4617.6 ft3) = 292.6ng/ft3. Lab reported 293ng/ft3.

Cu: (132.2ug/L) (0.1L/filter) = 13.22ug/filter. Lab reported 13.2ug/filter.

(13.22ug) (1000ng/ug) / (4617.6ft3) = 2.86ng/ft3. Lab reported 2.87ng/ft3.

Zn: (9019ug/L) (0.1L/filter) = 901.9ug/filter. Lab reported 902ug/filter.

(901.9ug) (1000ng/ug) / (4617.6ft3) = 195.3 ng/ft3. Lab reported 196ng/ft3.

10. OVERALL ASSESSMENT OF DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

☐ Acceptable
☒ Acceptable with Qualification
☐ Rejected

Accepted data meet the minimum requirements for the following EPA data category:

☐ ERS Screening
☐ Non-definitive with 10 % Conformation by Definitive Methodology
☐ Definitive, Comprehensive Statistical Error Determination was performed.
☒ Definitive, Comprehensive Statistical Error Determination was not performed.

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments: Data as reported are valid.

11. USABILITY OF DATA

A. These data are considered usable for the data use objectives stated in the EPA EMERGENCY RESPONSE SECTION AND SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM QUALITY ASSURANCE SAMPLING PLAN FOR SOIL, WATER AND MISCELLANEOUS MATRIX SAMPLING, HALACO SITE, OXNARD, VENTURA COUNTY, CALIFORNIA, APRIL 18, 2006 (QASP).

The following data use objective was indicated in the QASP:

TO ASSIST IN DETERMINING THE PRESENCE OR ABSENCE OF A HAZARDOUS MATERIAL OR SUBSTANCE AT LEVELS ABOVE AN AVAILABLE DETECTION OR QUANTIFICATION LEVEL.

TO ASSIST WITH DETERMINING THE AREA OF IMPACT DUE TO A HAZARDOUS MATERIAL RELEASE. (I.E., HORIZONTAL AND LATERAL EXTENT).

TO BE COMPARED TO WITH SITE-SPECIFIC ACTION LEVELS OR RISK-BASED ACTION LEVELS (E.G., EPA PRGS) TO ASSIST IN DETERMINATION IF HEALTH THREATS EXIST.

AS DEFINITIVE CONFIRMATORY DATA FOR CONFIRMATION OF NON-DEFINITIVE (SCREENING) DATA.

OTHER: TO PROVIDE EVIDENCE OF AN IMMINENT AND SUBSTANTIAL ENDANGERMENT PURSUANT TO THE NCP.

THE DATA ARE USABLE FOR THE ABOVE OBJECTIVE.

12. DOCUMENTATION OF LABORATORY CORRECTIVE ACTION

Problem: Dilution factor and results for sample AIR-1-230606-173 was incorrect.

Resolution: Revised Form I (data summary) was received.

Attached are copies of all data summary sheets, with data qualifiers indicated, and a copy of the chain of custody for the samples.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

Laboratory: EMAX Laboratories	Lab Project Number: 06G006
Sampling Dates: 6/26/06 thru 6/28/06	Sample Matrix: Air Filter
Analytical Method: METALS (6010B/7471A)	Data Reviewer: M.Song

REVIEW AND APPROVAL:

Data Reviewer: Mindy Song
Technical QA Reviewer: Mike Schwennesen
Project Manager: Caren Welch

Date: _____
Date: _____
Date: _____

SAMPLE IDENTIFICATION:

Sample No.	Sample I.D.	Laboratory I.D.
1	AIR-1-270606-1633	G006-01
2	AIR-2-270606-1637	G006-02
3	AIR-3-270606-1644	G006-03
4	AIR-4-270606-1623	G006-04
5	AIR-6-270606-1638	G006-05
6	AIR-6-260606-1309	G006-06
7	AIR-2-280606-1544	G006-07
8	AIR-1-280606-1548	G006-08
9	AIR-3-280606-1553	G006-09
10	AIR-4-280606-1556	G006-10
11	AIR-6-280606-1544	G006-11
12	FIELD ANALYTICAL BLANK	G006-12
13		
14		
15		
16		
17		
18		
19		
20		

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

DATA PACKAGE COMPLETENESS CHECKLIST:

Checklist Code:

<u> X </u>	Included: no problems
<u> * </u>	Included: problems noted in review
<u> O </u>	Not Included and/or Not Available
<u> NR </u>	Not Required
<u> RS </u>	Provided As Re-submission

Case Narrative:

<u> X </u>	Case Narrative present
--------------	------------------------

Quality Control Summary Package:

<u> X </u>	Data Summary sheets
<u> X </u>	Initial and Continuing Calibration results
<u> NR </u>	CRDL Standard results
<u> * </u>	Preparation Blank and Calibration Blank results
<u> X </u>	ICP Interference Check Sample results
<u> O </u>	Matrix Spike recoveries
<u> O </u>	Matrix Duplicate results
<u> * </u>	Laboratory Control Sample recoveries
<u> NR </u>	Method of Standard Additions results
<u> X </u>	ICP Serial Dilution results
<u> NR </u>	Instrument Detection Limits
<u> NR </u>	ICP Interelement Correction Factors
<u> NR </u>	ICP Linear Ranges
<u> X </u>	Preparation Log
<u> X </u>	Analysis Run Log

Raw QC Data Package Section

<u> X </u>	Chain-of-Custody Records
<u> X </u>	Instrument Printouts
<u> X </u>	Sample Preparation Notebook Pages
<u> X </u>	Logbook and Worksheet Pages
<u> NR </u>	Percent Solids Determination

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

DATA VALIDATION SUMMARY

The data were reviewed following procedures and limits specified in the EPA OSWER directive, *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (EPA/540/G-90/004, OSWER Directive 9360.4-01, dated April 1990).

Indicate with a YES or NO whether each item is acceptable without qualification:

1	Holding Times	YES
2	Initial and Continuing Calibrations	YES
3	Laboratory Control Sample	NO
4	Matrix Spike	NA
5	Blanks and Background Samples	NO
6	Duplicate Analyses	YES
7	Interference Check Samples and Serial Dilution Analysis	YES
8	Post Digestion Spike and Standard Addition Analysis	N/A
9	Analyte Quantitation	YES
10	Overall Assessment of Data	YES
11	Usability of Data	YES

Comments: N/A: Not Applicable. NA: Not Analyzed

Twelve air filter samples were analyzed for CAM Metals by EPA 6010B/7471A.

Percent recoveries of LCS except Barium and Zinc were within the control limits.

Detected Barium and Zinc results were qualified as estimated (J). Blank Filter was submitted for analysis. Blank Filter was submitted for analysis. Trace level of Be, Co, Pb, & Mo were detected but Ba, Cr, Cu, Ni, V & Zn were found at above the reporting limit. These metals detected in the samples were qualified as non-detect (U) when the sample concentration is less than 5X the blank concentration.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
Project Number: 60005003.27	

1. HOLDING TIMES

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable

Samples were extracted and analyzed within required holding times except as noted under Comments. In addition, no problems were identified with regard to sample preservation or custody unless specified. For those samples analyzed outside holding time requirements, the detected results have been qualified as estimated (J), and the nondetected results have been qualified either as estimated (UJ) or rejected (R) based on the reviewer's judgement.

All Sample Matrices:

Mercury: 28 days (from collection) for analysis.

Hexavalent chromium: 24 hours (from collection) for analysis.

All other metals: 180 days (from collection) for analysis.

Comments: All holding times were met.

2. INITIAL AND CONTINUING CALIBRATION VERIFICATION

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable

Unless flagged below, an initial calibration verification (ICV) and a calibration blank were analyzed at the beginning of the run, and a continuing calibration verification (CCV) and a calibration blank were analyzed after every ten samples, and at the end of the run. ICV and CCV recoveries were within a range of 80-120% for mercury and tin, and 90-110% for all other metals. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the recovery was below 65% or above 135% (for mercury and tin) or below 75% or above 125% (for all other metals), all associated data are rejected (R).

Comments: All recoveries of metals in initial and continuing calibration verifications were within the control limits.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
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3. LABORATORY CONTROL SAMPLE

☐ Acceptable
☒ Acceptable with qualification
☐ Unacceptable
☐ No Laboratory Control Samples Analyzed

Laboratory control sample recoveries are used for a qualitative indication of accuracy (bias) independent of matrix effects. LCS recovery limits should either be specified in the Sampling and Analysis Plan or can be established by the laboratory. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J).

In cases where the recovery was below 30%, all associated nondetected results are rejected (R) and detected results are qualified as estimated (J).

Comments: Percent recoveries of LCS except Barium and Zinc were within the control limits. Detected Barium and Zinc results were qualified as estimated (J).

4. MATRIX SPIKE

☐ Acceptable
☐ Acceptable with qualification
☐ Unacceptable
☒ No Matrix Spikes Analyzed

Matrix spike recoveries are used for a qualitative indication of accuracy (bias) due to matrix effects. Unless flagged below, one laboratory control sample was analyzed at a rate of one per batch or one per 20 samples. Recoveries were within a range of 75-125%.

For analytes which exceeded these control limits, associated detected results are qualified as estimated (J). In cases where the recovery was below 30%, all associated nondetected results are rejected (R) and detected results are qualified as estimated (J).

Comments: No sample was designated for matrix spike and matrix spike duplicate but LCS and LCD were analyzed instead.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
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5. BLANKS AND BACKGROUND SAMPLES

☐ Acceptable
☒ Detection Limits Adjusted

The following blanks were analyzed:

☒ Method (preparation) Blanks
☐ Field Blanks
☐ Calibration Blanks
☐ Rinsate Blanks
☐ Background Samples

Preparation (method) blanks were prepared for each batch of samples extracted. A preparation blank was analyzed after every continuing calibration standard, prior to sample analysis unless noted below. Any compound detected in the sample and also detected in any associated blank, must be qualified as non-detect (U) when the sample concentration is less than 5x the blank concentration.

Comments: Blank Filter was submitted for analysis. Trace level of Be, Co, Pb, & Mo were detected but Ba, Cr, Cu, Ni, V & Zn were found at above the reporting limit. These metals detected in the samples were qualified as non-detect (U) when the sample concentration is less than 5X the blank concentration.

6. DUPLICATE ANALYSES

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable
☐ No Duplicates Analyzed

Type of duplicates analyzed:

☐ Field Duplicates
☒ Laboratory Duplicates

Calculate the relative Percent Difference (RPD) between the members of duplicate pairs using the equation indicated below. Qualify the detected results as estimated (J) for any analyte whose RPD in a laboratory duplicate exceeds 20% for water samples or 35% for soil samples.

$$RPD = \frac{2(\text{Value 1} - \text{Value 2})}{\text{Value 1} + \text{Value 2}} \times 100\%$$

Comments: RPDs of LCS & LCD <35%.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
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7. INTERFERENCE CHECK SAMPLES AND SERIAL DILUTION ANALYSIS

☒ Acceptable
☐ Acceptable with qualification
☐ Unacceptable
☐ Not required

Interference Check Samples (ICS) - Unless flagged below, an ICS was analyzed at the beginning and end of each run and at least twice every eight hours. Recoveries were within a range of 80-120%. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J) if the concentrations of Al, Ca, Fe, or Mg are higher in the sample than in the ICS.

Serial Dilution Analysis - Unless flagged below, a serial dilution analysis was performed at a rate of one per 20 samples on a sample having analyte concentrations greater than 50 times the IDL. Percent differences were within a range of 0-10%. For analytes which exceeded these control limits, associated detected results are qualified as estimated (J).

Comments: ICS recoveries were within the control limit.

Sample AIR-6-280606-1544 was used for serial dilution and analytical spike and QC requirements were met.

8. POST DIGESTION SPIKE AND STANDARD ADDITIONS

☐ Acceptable
☐ Acceptable with qualification
☐ Unacceptable
☒ Not required

Post-digestion spikes - If a furnace AA result was flagged by the laboratory with an E to indicate interference, and the associated post-digestion spike recovery was less than 10%, the associated results are rejected (R).

Method of Standard Additions - If the method of standard additions was required and the correlation coefficient was less than 0.995, the associated results were qualified as estimated (J).

Comments:

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

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9. ANALYTE QUANTITATION

Confirm that analyte quantitation was performed correctly using the following formulas:

Water samples:

$$\text{ug/L} = \frac{(\text{Instrument printout concentration, mg/L})(1000 \text{ ug/mg})(\text{final volume of extract, mL})}{(\text{Initial volume of extract, mL})}$$

Soil samples:

$$\text{mg/kg} = \frac{(\text{Instrument printout concentration, mg/L})(\text{final volume of extract, mL})(0.001 \text{ L/mL})}{(\text{weight of sample extracted, g})(0.001 \text{ kg/g})(\text{fraction solids})}$$

Comments: Analyte quantitation is acceptable.

Laboratory reported results in ug/filter and ng/ft3.

Sample AIR-6-270606-1638 (10174.61 ft3)

Ba: (15330ug/L) (0.1L/filter) = 1533ug/filter. Lab reported 1530ug/filter.

(1533ug) (1000ng/ug) / (10174.61 ft3) = 150.7ng/ft3. Lab reported 150ng/ft3.

Cr: (137.8ug/L) (0.1L/filter) = 13.78ug/filter. Lab reported 13.8ug/filter.

(13.78ug) (1000ng/ug) / (10174.61 ft3) = 1.35ng/ft3. Lab reported 1.35ng/ft3.

Zn: (9476ug/L) (0.1L/filter) = 947.6ug/filter. Lab reported 948/filter.

(947.6ug) (1000ng/ug) / (10174.61 ft3) = 93.1ng/ft3. Lab reported 92.9ng/ft3.

10. OVERALL ASSESSMENT OF DATA

On the basis of this review, the following determination has been made with regard to the overall data usability for the specified level.

☐ Acceptable
☒ Acceptable with Qualification
☐ Rejected

Accepted data meet the minimum requirements for the following EPA data category:

☐ ERS Screening
☐ Non-definitive with 10 % Conformation by Definitive Methodology
☐ Definitive, Comprehensive Statistical Error Determination was performed.
☒ Definitive, Comprehensive Statistical Error Determination was not performed.

Any qualifications to individual sample analysis results are detailed in the appropriate section above or appear under the comments section below. In cases where several QC criteria are out of specification, it may be appropriate to further qualify the data usability. The data reviewer must use professional judgment and express concerns and comments on the data validity for each specific data package.

Comments: Data as reported are valid.

ANALYTICAL DATA REVIEW SUMMARY

Tier 2 Validation

Site Name: Halaco	Location: Oxnard, California
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11. USABILITY OF DATA

A. These data are considered usable for the data use objectives stated in the EPA EMERGENCY RESPONSE SECTION AND SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM QUALITY ASSURANCE SAMPLING PLAN FOR SOIL, WATER AND MISCELLANEOUS MATRIX SAMPLING, HALACO SITE, OXNARD, VENTURA COUNTY, CALIFORNIA, APRIL 18, 2006 (QASP).

The following data use objective was indicated in the QASP:

TO ASSIST IN DETERMINING THE PRESENCE OR ABSENCE OF A HAZARDOUS MATERIAL OR SUBSTANCE AT LEVELS ABOVE AN AVAILABLE DETECTION OR QUANTIFICATION LEVEL.

TO ASSIST WITH DETERMINING THE AREA OF IMPACT DUE TO A HAZARDOUS MATERIAL RELEASE. (I.E., HORIZONTAL AND LATERAL EXTENT).

TO BE COMPARED TO WITH SITE-SPECIFIC ACTION LEVELS OR RISK-BASED ACTION LEVELS (E.G., EPA PRGS) TO ASSIST IN DETERMINATION IF HEALTH THREATS EXIST.

AS DEFINITIVE CONFIRMATORY DATA FOR CONFIRMATION OF NON-DEFINITIVE (SCREENING) DATA.

OTHER: TO PROVIDE EVIDENCE OF AN IMMINENT AND SUBSTANTIAL ENDANGERMENT PURSUANT TO THE NCP.

THE DATA ARE USABLE FOR THE ABOVE OBJECTIVE.

12. DOCUMENTATION OF LABORATORY CORRECTIVE ACTION

Problem: No problems requiring corrective action were found.

Resolution: Not required.

Attached are copies of all data summary sheets, with data qualifiers indicated, and a copy of the chain of custody for the samples.