Form I
TCLP Metals

Client: **Metcalf & Eddy**
Project: **Mill Street - Brookfield**
Case: **N/A** SDG: **N/A**
Client ID: **TP-2-A**
Matrix: **Water**

BA 7/22/02

Lab Code: **M-MA030**
ETR: **0206065**
Lab ID: **0206065-10**
Concentration Units: **µg/L**
Date Collected: **06/10/02**
Date Received: **06/13/02**

Parameter	Result	Qualifier	Reporting Limit	Dilution	Date Analyzed	Date Prepared	Analytical Method	Analyst
Arsenic	**2.0**	J	2.5	5	06/24/02	06/21/02	6020A	LMR
Barium	**2100**		100	5	06/24/02	06/21/02	6020A	LMR
Cadmium	**22**	J	0.50	5	06/24/02	06/21/02	6020A	LMR
Chromium	**21**	J UJ	25	5	06/24/02	06/21/02	6020A	LMR
Lead	**940**		5.0	5	06/24/02	06/21/02	6020A	LMR
Mercury	0.27	U	0.50	1	06/25/02	06/25/02	7470A	LMR
Selenium	6.0	U	10	5	06/24/02	06/21/02	6020A	LMR
Silver	0.32	U	0.50	5	06/24/02	06/21/02	6020A	LMR

J - Below CRDL, Project DL, or RL but greater than or = MDL.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

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Form I
TCLP Metals

Client: **Metcalf & Eddy**
Project: **Mill Street - Brookfield**
Case: **N/A** SDG: **N/A**
Client ID: **TP-2-B**
Matrix: **Water**

SA 7/22/02

Lab Code: **M-MA030**
ETR: **0206065**
Lab ID: **0206065-11**
Concentration Units: **µg/L**
Date Collected: **06/10/02**
Date Received: **06/13/02**

Parameter	Result	Qualifier	Reporting Limit	Dilution	Date Analyzed	Date Prepared	Analytical Method	Analyst
Arsenic	**1.4**	J	2.5	5	06/24/02	06/21/02	6020A	LMR
Barium	**3900**		100	5	06/24/02	06/21/02	6020A	LMR
Cadmium	**18**	J	0.50	5	06/24/02	06/21/02	6020A	LMR
Chromium	**32**	U	25	5	06/24/02	06/21/02	6020A	LMR
Lead	**7800**		5.0	5	06/24/02	06/21/02	6020A	LMR
Mercury	0.27	U	0.50	1	06/25/02	06/25/02	7470A	LMR
Selenium	6.0	U	10	5	06/24/02	06/21/02	6020A	LMR
Silver	0.32	U	0.50	5	06/24/02	06/21/02	6020A	LMR

J - Below CRDL, Project DL, or RL but greater than or = MDL.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

06/26/02 09:54

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Form I
TCLP Metals

Client: **Metcalf & Eddy**
Project: **Mill Street - Brookfield**
Case: **N/A** SDG: **N/A**
Client ID: **KTP-2-B**
Matrix: **Water**

8A 7/22/02

Lab Code: **M-MA030**
ETR: **0206065**
Lab ID: **0206065-07**
Concentration Units: **µg/L**
Date Collected: **06/10/02**
Date Received: **06/13/02**

Parameter	Result	Qualifier	Reporting Limit	Dilution	Date Analyzed	Date Prepared	Analytical Method	Analyst
Arsenic	**1.3**	J	2.5	5	06/24/02	06/21/02	6020A	LMR
Barium	**3700**		100	5	06/24/02	06/21/02	6020A	LMR
Cadmium	**15**	J	0.50	5	06/24/02	06/21/02	6020A	LMR
Chromium	**28**	U	25	5	06/24/02	06/21/02	6020A	LMR
Lead	**6200**		5.0	5	06/24/02	06/21/02	6020A	LMR
Mercury	0.27	U	0.50	1	06/25/02	06/25/02	7470A	LMR
Selenium	6.0	U	10	5	06/24/02	06/21/02	6020A	LMR
Silver	0.32	U	0.50	5	06/24/02	06/21/02	6020A	LMR

J - Below CRDL, Project DL, or RL but greater than or = MDL.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

06/26/02 09:53

Form I
TCLP Metals

Client: **Metcalf & Eddy**
Project: **Mill Street - Brookfield**
Case: **N/A** SDG: **N/A**
Client ID: **TP-3-A**
Matrix: **Water**

SA 7/22/02

Lab Code: **M-MA030**
ETR: **0206065**
Lab ID: **0206065-13**
Concentration Units: **µg/L**
Date Collected: **06/10/02**
Date Received: **06/13/02**

Parameter	Result	Qualifier	Reporting Limit	Dilution	Date Analyzed	Date Prepared	Analytical Method	Analyst
Arsenic	**2.4**	J	2.5	5	06/24/02	06/21/02	6020A	LMR
Barium	**950**		100	5	06/24/02	06/21/02	6020A	LMR
Cadmium	**8.6**	J	0.50	5	06/24/02	06/21/02	6020A	LMR
Chromium	**17**	J UJ	25	5	06/24/02	06/21/02	6020A	LMR
Lead	**860**		5.0	5	06/24/02	06/21/02	6020A	LMR
Mercury	0.27	U	0.50	1	06/25/02	06/25/02	7470A	LMR
Selenium	6.0	U	10	5	06/24/02	06/21/02	6020A	LMR
Silver	0.32	U	0.50	5	06/24/02	06/21/02	6020A	LMR

J - Below CRDL, Project DL, or RL but greater than or = MDL.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

06/26/02 09:53

Form I
TCLP Metals

Client: **Metcalf & Eddy**
Project: **Mill Street - Brookfield**
Case: **N/A** SDG: **N/A**
Client ID: **TP-3-B**
Matrix: **Water**

SA 7/22/02

Lab Code: **M-MA030**
ETR: **0206065**
Lab ID: **0206065-14**
Concentration Units: **µg/L**
Date Collected: **06/10/02**
Date Received: **06/13/02**

Parameter	Result	Qualifier	Reporting Limit	Dilution	Date Analyzed	Date Prepared	Analytical Method	Analyst
Arsenic	**1.2**	J	2.5	5	06/24/02	06/21/02	6020A	LMR
Barium	**1600**		100	5	06/24/02	06/21/02	6020A	LMR
Cadmium	**2.8**	J	0.50	5	06/24/02	06/21/02	6020A	LMR
Chromium	**21**	J UJ	25	5	06/24/02	06/21/02	6020A	LMR
Lead	**1300**		5.0	5	06/24/02	06/21/02	6020A	LMR
Mercury	0.27	U	0.50	1	06/25/02	06/25/02	7470A	LMR
Selenium	6.0	U	10	5	06/24/02	06/21/02	6020A	LMR
Silver	0.32	U	0.50	5	06/24/02	06/21/02	6020A	LMR

J - Below CRDL, Project DL, or RL but greater than or = MDL.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

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Form I
TCLP Metals

Client: **Metcalf & Eddy**
Project: **Mill Street - Brookfield**
Case: **N/A** SDG: **N/A**
Client ID: **TP-4-B**
Matrix: **Water**

SA 7/22/02

Lab Code: **M-MA030**
ETR: **0206065**
Lab ID: **0206065-12**
Concentration Units: **µg/L**
Date Collected: **06/10/02**
Date Received: **06/13/02**

Parameter	Result	Qualifier	Reporting Limit	Dilution	Date Analyzed	Date Prepared	Analytical Method	Analyst
Arsenic	**2.0**	J	2.5	5	06/24/02	06/21/02	6020A	LMR
Barium	**210**		100	5	06/24/02	06/21/02	6020A	LMR
Cadmium	**53**	J	0.50	5	06/24/02	06/21/02	6020A	LMR
Chromium	**43**	U	25	5	06/24/02	06/21/02	6020A	LMR
Lead	**18000**		5.0	5	06/24/02	06/21/02	6020A	LMR
Mercury	0.27	U	0.50	1	06/25/02	06/25/02	7470A	LMR
Selenium	6.0	U	10	5	06/24/02	06/21/02	6020A	LMR
Silver	0.32	U	0.50	5	06/24/02	06/21/02	6020A	LMR

J - Below CRDL, Project DL, or RL but greater than or = MDL.
U - The analyte was analyzed for but not detected at the sample specific level reported.
N/A - Not Applicable

06/26/02 09:54

Attachment III

Data Validation Worksheets

Environmental Targeted Site Assessment
Site Name Mill Street, Brookfield, MA
Reference No. 00010.0000.00115

REGION I ORGANIC DATA VALIDATION

The following data package has been validated:

Lab Name Woods Hole Group
~~Case~~/Project No. 02060065
SDG No. NA
No. of Samples/Matrix 14/soil
1/Aq TB

SOW/Method No. MA DEP VPH/EPH 8082 PCBs
Sampling Date(s) 6/10,11,12/02
Shipping Date(s) 6/12/02
Date Rec'd by lab 6/13/02

Traffic Report Sample Nos. ME-1A-0-4; ME-4A-0-4; ME-1B-4-12; ME-2B-4-12; ME-3B-4-12; ME-4B-4-14 (VPH/EPH); KTP-2-B; TP-1-A; TP-2-A; TP-2-B; TP-4-B; TP-3-A; TP-3-B (VPH/EPH/PCB/TCLP metals)
ME-2A-3 (VPH only)
Trip Blank No. TB-01 (VPH only)
Equipment Blank No. —
Bottle Blank No. —
Field Duplicate Nos. TP-2-B/KTP-2-B (VPH/EPH/PCB)
PES Nos. —

The Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, revision _____ was used to evaluate the data and/or approved modifications to the EPA-NE Functional Guidelines were used to evaluate the data and are attached to this cover page: (attach modified criteria from EPA approved QAPjP or amendment to QAPjP).

A Tier II or Tier III evaluation was used to validate the data (circle one). If a Tier II validation with a partial Tier III was used, then identify samples, parameters, etc. that received partial Tier III validation

Modified Tier II

The data were evaluated based upon the following parameters:

	VPH	EPH	PCB	Metals
Overall Evaluation of Data	ok	*	ok	ok
Data Completeness (CSF Audit - Tier I)	~~ok~~	ok	ok	ok
Preservation & Technical Holding Times				
GC/MS & GC/ECD Instrument Performance Check				
Initial & Continuing Calibrations	*	ok	*	
Blanks	ok	ok	*	
Surrogate Compounds	ok	*	NA	
Internal Standards				
Matrix Spike/Matrix Spike Duplicate	ok	ok	*	
Field Duplicates	ok	*	ok	ok
Sensitivity Check	~~ok~~	ok	ok	ok
PE Samples/Accuracy Check	NA			
Target Compound Identification	NA			
Compound Quantitation and Reported Quantitation Limits	ok			*
TICs	NA			
Semivolatile and Pesticide/PCB Cleanup	NA			
System Performance	NA			
Laboratory Duplicate Precision	~~ok~~	*	NA	ok

Region I Definitions and Qualifiers:

A - Acceptable Data
J - Numerical value associated with compound is an estimated quantity.
R - The data are rejected as unusable. The R replaces the numerical value or sample quantitation limit.
U - Compound not detected at that numerical sample quantitation limit.
UJ - The sample quantitation limit is an estimated quantity.
TB, BB, EB - Compound detected in aqueous trip blank, aqueous bottle blank, or aqueous equipment blank associated with soil/sediment samples.

Validator's Name Sheila Harvey Company Name M&E, Inc. Phone Number 781-246-5200

Date Validation Started 7/9/02 Date Validation Completed 7/17/02

Check if all criteria are met and no hard copy worksheet provided. Indicate NA if worksheet is not applicable to analytical method. Note: there is no standard worksheet for System Performance, however, the validator must document all system performance issues in the Data Validation Memorandum.

VPH / EPH
~~VOA/SV~~ worksheets:

VOA/SV-Pest/PCB	COMPLETE SDG FILE (CSF) AUDIT	OK
VOA/SV-Pest/PCB-I	PRESERVATION AND HOLDING TIMES	OK
VOA/SV-II	GC/MS INSTRUMENT PERFORMANCE CHECK (TUNING)	NA
VOA/SV-III	INITIAL CALIBRATION	OK
VOA/SV-IV	CONTINUING CALIBRATION	* EPH
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS	OK
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS	↓
VOA-VI	VPH ~~VOA~~ SURROGATE SPIKE RECOVERIES	*
SV-VI	EPH ~~SV~~ SURROGATE SPIKE RECOVERIES	OK
VOA/SV-VII	INTERNAL STANDARD PERFORMANCE	
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE	* VPH
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE PRECISION	OK
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK	OK
VOA/SV-Pest/PCB-XI	ACCURACY CHECK	NA
VOA/SV-Pest/PCB-XII	TARGET COMPOUND IDENTIFICATION	↓
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION	
VOA/SV-XIV	TENTATIVELY IDENTIFIED COMPOUNDS	
VOA/SV-XV	SEMIVOLATILE CLEANUP	
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	OK
	Lab duplicate precision	* EPH

~~Pest~~PCB worksheets:

VOA/SV-Pest/PCB	COMPLETE SDG FILE (CSF) AUDIT	*
VOA/SV-Pest/PCB-I	PRESERVATION AND HOLDING TIMES	OK
Pest/PCB-IIA	GC/ECD INSTRUMENT PERFORMANCE CHECK-RESOLUTION	NA
Pest/PCB-IIB	GC/ECD INSTRUMENT PERFORMANCE CHECK-RETENTION TIMES	↓
Pest/PCB-IIC	GC/ECD INSTRUMENT PERFORMANCE CHECK-ACCURACY CHECK OF INITIAL CALIBRATION	
Pest/PCB-IID	GC/ECD INSTRUMENT PERFORMANCE CHECK-PESTICIDE DEGRADATION	↓
Pest/PCB-III	INITIAL CALIBRATION	OK
Pest/PCB-IV	CONTINUING CALIBRATION	*
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS	OK
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS	"
Pest/PCB-VI	SURROGATE COMPOUNDS: SPIKE RECOVERIES AND RETENTION TIME SHIFT	*
Pest/PCB-VII	PESTICIDE CLEANUP	NA
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE	OK
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE PRECISION	OK
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK	OK
VOA/SV-Pest/PCB-XI	ACCURACY CHECK	NA
Pest/PCB-XII	COMPOUND IDENTIFICATION	↓
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION	
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	

I certify that all criteria were met for the worksheets checked above.

Signature: Sheila Hawey, M+E, Inc. Name: Sheila Hawey

Date: 7/16/02

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB

COMPLETE SDG FILE (CSF) AUDIT

Organic Fractions: PCB

Missing Information	Date Lab Contacted	Date Received
PCB Continuing Cal. run Sequence	7/16/02	7/17/02

Validator: Sheila Haney

Date: 7/17/02

12/96

EPA-NE - Data Validation Worksheet
VOA/SV-III

III. INITIAL CALIBRATION - List all analytes that are outside calibration criteria.

PCBs: all criteria met
VPH: all %RSD < 25% for individual analytes. all criteria met

Date of ICAL	Instrument	Parameter	Matrix	Compound	% RSD	~~IRF~~ r2	Samples Affected	Action
6/28/02	HP-TPH C0528 PAH, MTH	EPH	Soil	Benzo(k)fluoranthene	—	0.990	all EPH samples	UJ(ND) all EPH samples

Comments:

Validator: Sherle Harvey

Date: 7/10/02

EPA-NE - Data Validation Worksheet
VOA/SV-IV PCB

Pg 1 of 3

IV. CONTINUING CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Date of CCAL	Instrument	Parameter	Matrix	Compound	%D	RRF	Samples Affected	Action
6/17/02		col. 2 CLP II	PCB	Soil	PK#1 A1260	16.0	–	None. Sample results not reported from this column	
					PK#2 A1260	15.5			
					PK#3 A1260	16.1			
		col. 1 RTX-5			PK#1 A1260	15.3		None. no samples analyzed with this CC stnd.	
					PK#2 A1260	15.3			
					PK#4 A1260	16.0			
		col. 2 CLP-II			PK#1 A1016	20.8		None. Sample results not reported from this column	
					PK#2 A1016	21.3			
					PK#3 A1016	19.8			
					PK#4 A1016	15.2			
					PK#1 A1260	29.9			
					PK#2 A1260	31.7			
					PK#3 A1260	29.4			
					PK#4 A1260	30.5			

Comments:

Validator: Sheila Harvey

Date: 7/12/02

12/96

EPA-NE - Data Validation Worksheet
VOA/SV-IV

PCB

pg 2 of 3

IV. CONTINUING CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Date of CCAL	Instrument	Parameter	Matrix	Compound	%D	RRF	Samples Affected	Action
6/17/02		Col. 2 CLP II	PCB	Soil	PK#5 A1260	33.5		None. sample results not reported from this column	
					tetrachloro-m&p-xylene	18.5			
					Decachlorobiphenyl	22.4			
		Col 2 CLP-II			PK#4 A1016	19.7			
					PK#5 A1016	16.9			
					PK#1 A1260	22.3		None. sample results not reported from this column	
					PK#2 A1260	23.8			
					PK#3 A1260	22.2			
					PK#4 A1260	21.1			
					Decachlorobiphenyl	19.5			
		Col. 2 CLP II			PK#1 A1016	15.6			
					PK#2 A1016	22.1		none sample results not reported from this column	
					PK#4 A1016	19.4			
					PK#5 A1016	19.4			

Comments:

Validator: Sherle Harvey

Date: 7/12/02

12/96

EPA-NE - Data Validation Worksheet
VOA/SV-IV

PCB

IV. CONTINUING CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Date of CCAL	Instrument	Parameter	Matrix	Compound	%D	RRF	Samples Affected	Action
6/17/02		Col. 2 CLP II (cont'd)	PCB	Soil	PK#1 A1260	24.1			
					PK#2 A1260	25.0		None. Sample results not reported from this column	
					PK#3 A1260	28.3			
					PK#4 A1260	25.0			
					PK#5 A1260	37.4			
					tetrachloro-meta-xylene	20.0			
					Decachlorobiphenyl	24.7			

Comments:

Validator: Sheila Hawey

Date: 7/12/02

12/96

TCLP Metals

Region I
Inorganic Data Review Worksheets

III A. INSTRUMENT CALIBRATION (Section 1)

1. Recovery Criteria

List the analytes which did not meet the percent recovery (%R) criteria for Initial and/or Continuing Calibration.

DATE	ICV/CCV#	ANALYTE	%R	ACTION	SAMPLES AFFECTED
6/24/02	ICV	Ag	112.0	J(+) / A(ND)	all

ACTIONS:

If any analyte does not meet the %R criteria follow the actions stated below:

For positive results:

	Accept	Estimate (J)	Reject (R)
Metals	90%-110%	75%-89% or 111%-125%	< 75% or > 125%
Mercury	80%-120%	65%-79% or 121%-135%	< 65% or > 135%
Cyanide	85%-115%	70%-84% or 116%-130%	< 70% or > 130%

For non-detected results:

	Accept	Estimate (UJ)	Reject (R)
Metals	90%-125%	75%-89%	< 75% or > 125%
Mercury	80%-135%	65%-79%	< 65% or > 135%
Cyanide	85%-130%	70%-84%	< 70% or > 130%

Region I
Inorganic Data Review Worksheets

IV A. BLANK ANALYSIS RESULTS (Sections 1-3)

List the blank contamination in sections 1 and 2 below. A separate worksheet should be used for soil and water blanks.

1. **Laboratory Blanks** **Matrix:** Soil

DATE:	ICB/CCB#	PREP BL	ANALYTE	CONC./UNITS µg/L
6/20/02		PW1 1:2 dilution	Ba	80
"		"	Cr	12
"		PW2	Ba	73
"		"	Cr	13

2. Equipment/Trip Blanks

DATE:	EQUIP BL #	ANALYTE	CONC./UNITS

3. **Frequency Requirements**

A. Was a preparation blank analyzed for each matrix, for every 20 samples, and for each digestion batch? **Yes or No**

B. Was a calibration blank run at the beginning of the run, and every 10 samples or every 2 hours whichever is more frequent? **Yes or No**

If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected:

Region I
Inorganic Data Review Worksheets

IV B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Level for any analyte is equal to 5X the highest concentration of that analyte found in any blank. (Use 5X the absolute value for any negative blank results). The Action Level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL) for that analyte. Specific actions are as follows:

1. When the concentration is greater than the IDL, but less than the Action Level, report the sample concentration detected with a U.

2. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

Matrix: Soil			Matrix:		
ELEMENT	MAX. CONC. UNITS ug/L	AL UNITS ug/L	ELEMENT	MAX. CONC. UNITS	AL UNIT
Ba	80	400			
Cr	13	65			

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

$$\text{conc. in ug/l} \times \frac{\text{Volume diluted to (200ml)}}{\text{Weight digested (1gram)}} \times \frac{1\text{L}}{1000\text{ml}} \times \frac{1000\text{g}}{1\text{kg}} \times \frac{1\text{mg}}{1000\text{ug}} = \text{mg/kg}$$

Multiplying this result by 5 to arrive at the Action Level gives a final result in mg/kg which can then be compared to sample results

Ba: ~~TP-4-B~~ none since 1:2 PB dilution and 1:5 SR dilution
~~400 x 5 = 1000~~
~~2~~

Cr: TP-1-A, TP-2-A, TP-2-B, KTP-2-B, TP-3-A, TP-3-B, TP-4-B

EPA-NE - Data Validation Worksheet
VOA-VI

VI. ~~VOA~~ VPH SURROGATE SPIKE RECOVERIES - List all surrogate compound recoveries that are outside method QC acceptance criteria.

Method	1,4-difluorobenzene ~~Toluene d_8~~	Volatile Method QC Acceptance Criteria			
		BFB	DCE-d_4	Other:	
OLM03.2	~~Water~~ ~~88-110~~ ~~Soil~~ ~~84-138~~ 70-130	Water 86-115 Soil 59-113	Water 76-114 Soil 70-121		
OLC02.1	NA	80-120	NA		
Other:	FID PID				
Sample Number/Matrix	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**Action**
TP-3-A	— 69				UJ(ND) aromatic results
TP-2-B	49 49				UJ(ND) aliphatic + aromatic results
RTP-2-B	47 46				UJ(ND) aliphatic + aromatic results
TP-4-B	23 20			UJ(ND) + J(+) aromatic and UJ(ND) aliphatic results	

Validator: Sheila Harvey

Date: 7/11/02

EPA-NE - Data Validation Worksheet
SV-VI PCB

VI. ~~SV~~ SURROGATE SPIKE RECOVERIES - List all surrogate compound recoveries that are outside method QC acceptance criteria.

Method	Base/Neutral Method QC Acceptance Criteria					
	NBZ-d_5	2-FBP	TPH-d_{14}	1,2-DCB-d_4*	Other:	
OLM03.2	Water Soil 35-114 23-120	Water Soil 43-116 30-115	Water Soil 33-141 18-137	Water Soil 16-110 20-130		
OLC02.1	~~40-110~~	30-110	20-140	~~NA~~		
Other:						
Sample Number/Matrix	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	Action

Method	Acid Method QC Acceptance Criteria					
	TMX ~~Phenol-d_5~~ 2	~~2-FBP~~ DCB2	2,4,6-TBP	2-CP-d_4*	Other:	
OLM03.2	Water Soil 10-110 24-113	Water Soil 21-110 25-121	Water Soil 10-123 19-122	Water Soil 33-110 20-130		
OLC02.1	~~15-115~~	~~15-110~~	15-130	NA		
Other: 8082	Soil 30-150%	Soil 30-150%				
Sample Number/Matrix	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	Action
KTP-2-B | Soil	—	156				
TP-2-B | Soil	—	182				
TP-3-A MSD | Soil	—	192				None on QC samples

* Advisory Surrogates - OLM03.2

Validator: Sheila Harvey

Date: 7/12/02

— : Indicates met criteria
TMX : Tetrachloro-meta-xylene
DCB : Decachlorobiphenyl
2 : Column #2

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-VIII

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE - List all MS/MSD analytes that are outside method QC acceptance criteria.

EPH - all criteria met
PCB - all criteria met

Use a separate worksheet for each MS/MSD pair.

Sample # TP-3-A Matrix Soil Concentration Level VPH low

Parameter	Compound	MS %Rec	MSD %Rec	RPD	Method QC Limits		Concentration			% RSD	Action
					% Rec	RPD	Unspiked Sample	MS	MSD		
VPH	n-Nonane	175	—	—	70-130	—					

Validator: _____ Date: _____

XI. INDUCTIVELY COUPLED PLASMA (ICP) SERIAL DILUTION ANALYSIS

_____ Serial dilutions were performed for each matrix and results of the diluted sample analysis agreed within = 10% of the original undiluted analysis.

_____ Serial dilution was not performed for the following:

_____

✓ Serial dilutions were performed, but analytical results did not agree within = 10% for analyte concentrations greater than 50X the ~~IDL~~ RL before dilution.

Report all results below that do not meet the required laboratory criteria for ICP serial dilution analysis.

Matrix: Soil TP-3-A

ELEMENT	~~IDL~~ RL	50X IDL	SAMPLE RESULT	SERIAL DILUTION	% D	ACTION
Aluminum						
Antimony						
Barium						
Beryllium						
Cadmium	0.10	5	8.6	9.9	16	J(+) all samples
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Silver						
Sodium						
Vanadium						
Zinc						

Actions apply to all samples of the same matrix

ACTIONS:

1. Estimate (J) all positive results and (UJ) all nondetects if the % D > 15%.

TCLP Metals

Region I
Inorganic Data Review Worksheets

XIII. SAMPLE QUANTITATION (continued)

(8W)

List the positive sample results that were reported at concentrations less than ~~2xIDL~~ RL but > MDL and have not already been qualified. The positive results have been estimated (J) due to uncertainty in the quantitation ~~near the IDL~~.

Analyte	Samples Affected
* Cr	TP-1-A, TP-2-A, TP-3-A, TP-3-B
As	TP-2-A, TP-2-B, KTP-2-B, TP-3-A, TP-3-B, TP-4-B

* The positive chromium results in the samples listed above were previously qualified nondetect "U" due to blank contamination and further qualified as estimated, nondetect (UJ) due to blank contamination and uncertainty in quantitation.

Metcalf & Eddy

30 Harvard Mill Square
Wakefield, MA 01880-5371
P.O. Box 4071
Wakefield, MA 01880-5371

Tel: 781-246-5200
Fax: 781-245-6293
www.m-e.com

036200100.0006.000115

July 12, 2002

Ms. Christine Clark
USEPA - New England
OEME - QA Unit
11 Technology Drive
North Chelmsford, Massachusetts 01863-2431

Re: Work Assignment No. 106-SIBZ-01ZZ
Case No. 30584, SDG No. MALR20
Sentinel, Inc., Huntsville, Alabama
Targeted Brownfields Site Assessment: Mill Street, Brookfield, Massachusetts
Modified Tier II Inorganic Data Validation

Metals: 13/Soil/MALR20, MALR23, MALR24, MALR25, MALR26, MALR27, MALR28, MALR29, MALR30, MALR31, MALR32, MALR33, MALR34 (Field Duplicates/MALR28 and MALR33)

Dear Ms. Clark:

A modified Tier II data validation was performed by Metcalf & Eddy, Inc. (M&E) on the inorganic analytical data for thirteen soil samples collected from the Mill Street Targeted Brownfields Assessment (TBA) site, located in Brookfield, Massachusetts by M&E field personnel on June 10, 11 and 12, 2002. The samples were analyzed for metals under the Contract Laboratory Program Routine Analytical Services (RAS) using the EPA *Statement of Work for Inorganics Analysis, Multi-Media, Multi-Concentration, ILM04.1.* M&E evaluated the data using the *Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, June 13, 1988 criteria, and incorporated new organic data validation guidance from *Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses*, December 1996 criteria, as deemed appropriate. All samples were received by the laboratory on June 13, 2002. The data package was received in the M&E office on June 25, 2002.

M&E reviewed the data in accordance with the EPA-approved Final Field Task Work Plan for the site, and the guidance received from EPA Work Assignment Manager, Mr. James Byrne, in a September 17, 1999 letter to former M&E Work Assignment Manager, Barb Wyskowski. The format of the validation memoranda underwent modification as of July 2001 at the request of the EPA Project Chemist, Alan Peterson, with the approval of Mr. Byrne. The data review included the following:

*	•	Data Completeness
*	•	Holding Times
	•	Instrument Calibration
	•	Blank Analysis Results
	•	Inductively Coupled Plasma (ICP) Interference Check Sample Results
	•	Matrix Spike (MS) Recoveries
	•	Laboratory Duplicate Sample Results
	•	Field Duplicate Sample Results
*	•	Laboratory Control Sample (LCS) Results
*	•	Furnace Atomic Absorption Results
*	•	ICP Serial Dilution Results
*	•	Instrument Detection Limits (IDL)
	•	Sample Quantitation Results
NA	•	Performance Evaluation Sample

*	=	All criteria met for this parameter
NA	=	Not applicable and/or no information was provided by the laboratory

Note: Worksheets are not included for parameters that have met criteria or for criteria that are not applicable to the method and/or to Tier II data validation.

Instrument Calibration

Analyte	Percent Recovery	QC Limits (%)	Action
Lead	138.0, 120.7	80-120 %	No Action. All sample results >3x CRDL (9 µg/L)
Mercury	130.0	80-120 %	Estimate (J)the positive results <3x CRDL (0.3 gµ/L) in samples MALR29, MALR31, MALR32, MALR33, and MALR34.

The positive Mercury results in the above listed samples were qualified as nondetect (U) due to blank contamination. Therefore, these results are further qualified as estimated, nondetect(UJ) due to blank contamination and poor CRDL standard recovery.

Blank Analysis Results

A review of laboratory blank analysis results indicates the presence of laboratory contamination for the analytes listed below. Positive sample results reported with concentrations less than the blank action level (BAL) for that compound are considered to be false positive results.

Analyte	Max. Conc. Contaminant (µg/L)	BAL* (mg/kg)	Affected Samples/Action
Aluminum	-77.0 75.4	-77.0 75.4	None. All sample results >BAL.
Antimony	4.4	4.4	Qualify the reported value as nondetect (U) in samples MALR20, MALR28, MALR31, MALR32, and MALR33.
Barium	2.6	2.6	None. All sample results >BAL.
Beryllium	0.3	0.3	Qualify the reported value as nondetect (U) in samples MALR23, MALR24, MALR25, MALR26, MALR28, MALR29, MALR30, MALR31, MALR32, MALR33, and MALR34.
Iron	49.9	49.9	None. All sample results >BAL.
Magnesium	69.0	69.9	None. All sample results >BAL.
Manganese	0.7	0.7	None. All sample results >BAL.
Potassium	0.4	0.4	None. All sample results >BAL.
Vanadium	0.8	0.8	None. All sample results >BAL.
Zinc	1.6	1.6	None. All sample results >BAL.

* The sample-specific preparation factors and percent solids were taken into account when evaluating blank contamination.

Blank Actions:

* concentration ≤ BAL; report value on summary table as U.
* concentration < absolute value of the negative BAL; report new IDL.
* concentration >negative BAL, report value unqualified.
* concentration > BAL; report value unqualified.

ICP Interference Check Sample Results

The following sample results have been affected by iron interference:

Sample	Interferent/Conc. (µg/L)	Analyte	Estimated Interference (µg/L)	Action
MALR20	Iron 120,940	Barium	1.9	No action since false positive not suspected and estimated interference is <10% of sample result.
		Chromium	-2.5	No action since false negative not suspected and estimated interference is <10% of sample result.
		Cobalt	-6.2	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased low due to the high concentration of iron.
		Copper	18.0	No action since false positive not suspected and estimated interference is <10% of sample result.
		Manganese	5.6	No action since false positive not suspected and estimated interference is <10% of sample result.
		Sodium	972.5	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased high due to the high concentration of iron.
		Vanadium	-2.5	No action since false negative not suspected and estimated interference is <10% of sample result.
		Zinc	6.8	No action since false positive not suspected and estimated interference is <10% of sample result.

Sample	Interferent/Conc. (µg/L)	Analyte	Estimated Interference (µg/L)	Action
MALR27	Iron 106,620	Barium	1.6	No action since false positive not suspected and estimated interference is <10% of sample result.
		Chromium	-2.2	No action since false negative not suspected and estimated interference is <10% of sample result.
		Cobalt	-5.5	No action since false positive not suspected and estimated interference is <10% of sample result.
		Copper	1.6	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased high due to the high concentration of iron.
		Manganese	4.9	No action since false positive not suspected and estimated interference is <10% of sample result.
		Sodium	857.3	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased high due to the high concentration of iron.
		Vanadium	-2.2	No action since false negative not suspected and estimated interference is <10% of sample result.
		Zinc	6.0	No action since false positive not suspected and estimated interference is <10% of sample result.

Sample	Interferent/Conc. (µg/L)	Analyte	Estimated Interference (µg/L)	Action
MALR28	Iron 113,120	Barium	1.7	No action since false positive not suspected and estimated interference is <10% of sample result.
		Chromium	-2.3	No action since false negative not suspected and estimated interference is <10% of sample result.
		Cobalt	-5.8	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased low due to the high concentration of iron.
		Copper	1.95	No action since false positive not suspected and estimated interference is <10% of sample result.
		Manganese	5.2	No action since false positive not suspected and estimated interference is <10% of sample result.
		Sodium	909.6	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased high due to the high concentration of iron.
		Vanadium	-2.3	No action since false negative not suspected and estimated interference is <10% of sample result.
		Zinc	6.38	No action since false positive not suspected and estimated interference is <10% of sample result.
MALR32	Iron 218,490	Barium	3.4	No action since false positive not suspected and estimated interference is <10% of sample result.
		Chromium	-4.5	No action since false negative not suspected and estimated interference is <10% of sample result.

Sample	Interferent/Conc. (µg/L)	Analyte	Estimated Interference (µg/L)	Action
MALR32	Iron 218,490	Cobalt	-11.2	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased low due to the high concentration of iron.
		Copper	32.5	No action since false positive not suspected and estimated interference is <10% of sample result.
		Manganese	10.1	No action since false positive not suspected and estimated interference is <10% of sample result.
		Sodium	636.4	No action since false positive not suspected and estimated interference is <10% of sample result.
		Vanadium	-4.5	No action since false negative not suspected and estimated interference is <10% of sample result.
		Zinc	12.3	No action since false positive not suspected and estimated interference is <10% of sample result.
MALR33	Iron 136,510	Barium	2.1	No action since false positive not suspected and estimated interference is <10% of sample result.
		Chromium	-2.8	No action since false negative not suspected and estimated interference is <10% of sample result.
		Cobalt	-7.0	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased low due to the high concentration of iron.
		Copper	20.3	No action since false positive not suspected and estimated interference is <10% of sample result.

Sample	Interferent/Conc. (µg/L)	Analyte	Estimated Interference (µg/L)	Action
MALR33	Iron 136,510	Manganese	6.3	No action since false positive not suspected and estimated interference is <10% of sample result.
		Sodium	1097	Estimate (J) positive result in this sample. Interference is >10% but <90% of the sample concentration. Therefore, the positive result may be biased high due to the high concentration of iron.
		Vanadium	-2.8	No action since false negative not suspected and estimated interference is <10% of sample result.
		Zinc	7.7	No action since false positive not suspected and estimated interference is <10% of sample result.

Matrix Spike Recoveries

The matrix spike recoveries for soil sample MA02R4 that did not meet acceptance criteria of 75-125 percent recovery (%R), indicating possible matrix interference, are summarized below:

Analyte	Spiked Sample Result (mg/kg)	Sample Result (mg/kg)	Matrix Spike %R	Affected Samples/Action
Antimony	65.3261	0.8627	57.6	Estimate (J) positive result in samples MALR20, MALR28, MALR31, MALR32, and MALR33. Estimate (UJ) nondetect result in samples MALR23, MALR24, MALR25, MALR26, MALR27, MALR29, MALR30, and MALR34. Samples results may be biased low.
Chromium	63.8213	33.0640	67.7	Estimate (J) positive results in all samples. Sample results may be biased low.
Copper	103.8054	95.5977	14.5	Estimate (J) positive results in all samples. Samples results may be biased low.

The positive Antimony results in the above listed samples were previously qualified as nondetect (U) due to blank contamination and are further qualified as estimated, nondetect (UJ) due to blank contamination and poor matrix spike recovery. The positive Copper result in sample MALR27 was previously qualified as estimated (J) due to interference from Iron. Therefore, no further action is taken on this result due to poor matrix spike recovery.

Laboratory Duplicate Sample Results

The analytes that did not meet acceptance criterion of relative percent difference (%RPD) < 35% in soil sample MALR29 is summarized in the following table:

Analyte	Sample Result (mg/kg)	Duplicate Sample Result (mg/kg)	%RPD	Affected Samples/Action
Calcium	2935.4255	6086.9575	69.9	Estimate (J) positive results in all samples. A bias could not be determined.
Chromium	33.0640	17.9431	59.3	Estimate (J) positive results in all samples. A bias could not be determined.
Lead	190.0643	119.2681	45.8	Estimate (J) positive results in all samples. A bias could not be determined.

The positive Chromium results in all samples were previously qualified as estimated (J) due to poor matrix spike recovery. Therefore, no further action is taken due to poor laboratory duplicate precision.

Field Duplicate Sample Results

The analytes that did not meet acceptance criterion for relative percent difference (RPD) of ≤50% in field duplicate samples MALR33 and MALR28 are summarized in the following table :

Analyte	Sample Result (mg/kg)	Duplicate Sample Result (mg/kg)	%RPD	Affected Samples/Action
Aluminum	26200	9450	94	Estimate (J) the positive result in all samples. A bias could not be determined.
Copper	6380	308	182	Estimate (J) the positive result in all samples. A bias could not be determined.
Nickel	56.5	18.9	99.7	Estimate (J) the positive result in all samples. A bias could not be determined.
Zinc	1690	788	73	Estimate (J) the positive result in all samples. A bias could not be determined.

The positive Copper results in all samples were previously qualified as estimated (J) due to interference from Iron or due to poor matrix spike recovery. Therefore, no further action is taken due to poor field duplicate precision.

Sample Quantitation Results

The following table summarizes the positive sample results and the blank-qualified sample results that are less than two times the IDL and were not previously qualified as estimated (J) due to quality control parameters discussed above. The listed results are qualified as estimated (J) due to uncertainty in the quantitation near the IDL:

Analyte	Affected Samples
Arsenic	MALR24; MALR27
Beryllium	MALR26
Selenium	MALR23; MALR24; MALR28; MALR29; MALR32
Thallium	MALR27; MALR32

Please contact Constance Lapite at (781) 224-6628 if you have any questions regarding this information.

Very truly yours,

METCALF & EDDY, Inc.

Elizabeth DeCola
Initial Data Validator

Sheila Harvey
Senior Reviewer

Constance Lapite
M&E RAC Lead Chemist

cc: Barbara Weir, Project Manager (memo only)
Denise Laferte, Project Chemist (entire package)
E. DeCola, Data Validator (entire package)
BTSA Mill Street Project File (WA No. 106-SIBZ-01ZZ)

Attachments: IRDA Form
Chain-of-Custody Forms
Validated Sample Result Summary Sheets (Form Is)
Data Validation Worksheets
Copies of Telephone Logs/Communication Forms (not applicable)
CSF Audit (DC-2 Form)
DQO Summary Form

J:\ne\brwnflds\MillstreetBrookfield\dataval\MALR20

Attachment I

IRDA Form

Region I
Inorganic Data Review Worksheets

Region I

INORGANIC REGIONAL DATA ASSESSMENT

Brownfields Targeted Site Assessment Site:

CASE NO. 30584 SITE Mill St., Brookfield, MA

LABORATORY Sentinel Inc., Huntsville, AL NO OF SAMPLES/MATRIX 13 / Soil

SDG # MALR20 REVIEWER(IFNOT ESD) M+E, Inc.

SOW # ILM04.1 REVIEWER'S NAME E. DeGola

DPO:ACTION _____ FYI X COMPLETION DATE July 12, 2002

DATA ASSESSMENT SUMMARY

		ICP	AA	HG	CYANIDE
1.	HOLDING TIMES	O	NA	O	NA
2.	CALIBRATIONS	O		O[1]	
3.	BLANKS	O[2]		O	
4.	ICS	O[3]		NA	
5.	LCS	O		O	
6.	DUPLICATE ANALYSIS	O[4]		O	
7.	MATRIX SPIKE	O[5]		O	
8.	MSA	NA		NA	
9.	SERIAL DILUTION	O		NA	
10.	SAMPLE VERIFICATION	O[6]		O	
11.	OTHER QC	NA		O	
12.	OVERALL ASSESSMENT	O	↓	O	↓

O = Data had no problems, or qualified due to minor problems.
M = Data qualified due to major problems.
Z = Data unacceptable.
X = Problems, but do not affect data.

ACTION ITEMS: O[1]: positive results for mercury in several samples estimated due to low CRDL standard recovery. O[2]: several samples were qualified as U; O[3]: several samples were qualified for J(+) for possible iron interference; O[4]: positive results for Ca, Cr, Pb in all samples; O[5]: The positive and non detect results for Sb; ~~AREAS OF CONCERN:~~ Cr, Cu eliminated due to low matrix spike recoveries; O[6] - positive & blank qualified results for As, Be, Se, Tl in several samples estimated due to uncertainty near IDL.

NOTABLE PERFORMANCE: _____

Attachment II

Chain-of-Custody

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

SDG No.: MALR20
Case No.: 30584

1. Matrix (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Field QC
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (specify in Column A)

2. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (specify in Column D)
N. Not Preserved

3. Region No.: I
Sampling Co.: M&E
5. Date Shipped:
Carrier: Federal Express
7. Date Received – Received by: 06/13/02 P. Muller
Sampler (Name): Philippa Odgers
Airbill Number: 8306 0505 9005
Laboratory Contract Number: 68W00085
Unit Price: 100.00
Sampler Signature: [signature]
6. Ship To: Sentinel Inc
116 Washington Street, NE
Huntsville, AL 35801
ATTN: Karen Mitchel / Kelly Fis
8. Transfer to:
Date Received
Received by:
Contract Number
Price

4. Purpose*
Lead: SF, PRP, ST, FED
Early Action: CLEM, PA, REM, RI, SI, ESI
Long-Term Action: FS, RD, RA, O&M, NPLD

CLP Sample Numbers (from labels)	A Matrix (from Box 1) Other:	B Conc.: Low Med High	C Sample Type: Comp./ Grab	D Preservative (from Box 2) Other:	E — RAS Analysis: Diss. Metals	Total Metals	Cyanide	Low Only: NO_2/NO_3	Fluoride	High Only: pH	Conduct.	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/ Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K High Phases: Solids	Water-Miscible Liq.	Water Immiscible Liq.
MALR20	5	L	C	6		X						169533	ME-1A-0-4	6/11/02 1130	–	P.O.			
MALR23	5	L	C	6		X						169534	ME-4A-0-4	6/12/02 1010	–	P.O.			
MALR24	5	L	C	6		X						169535	ME-1B-4-12	6/11/02 1230	–	P.O.			
MALR25	5	L	C	6		X						169536	ME-2B-4-12	6/11/02 1600	–	P.O.			
MALR26	5	L	C	6		X						169537	ME-3B-4-12	6/12/02 1400	–	P.O.			
MALR27	5	L	C	6		X						169538	ME-4B-4-14	6/12/02 1045	–	P.O.			
MALR28	5	L	C	6		X						169540	KTP-2-B	6/10/02 1305	–	P.O.			
MALR29	5	L	C	6		X						169539, 188743	TP-3-A	6/10/02 1345	–	P.O.			
MALR30	5	L	C	6		X						169541	TP-1-A	6/10/02 1005	–	P.O.			
MALR31	5	L	C	6		X						169542	TP-2-A	6/10/02 1140	–	P.O.			

Shipment for Case Complete? (Y/N): Y
Page 1 of 2
Sample(s) to be Used for Laboratory QC: MALR29
Additional Sampler Signatures:
Chain of Custody Seal Number(s):

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	6/11/02 1700	Fedex airbill no.			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Is custody seal intact? (Y)N/none	
		P. Muller	06/13/02 1000		

Distribution: Green - Region Copy; White - Lab Copy for Return to Region; Pink - CLASS Copy; Yellow - Lab Copy for Return to CLASS

EPA Form 9110-1 (8/99)

See Reverse for Additional Standard Instructions
*See Reverse for Purpose Code Definitions

A21-012-14 REV

EPA United States Environmental Protection Agency Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analyis)

SAS No. (if applicable):
Case No.: 30584

1. Matrix (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Field QC
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (specify in Column A)

2. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (specify in Column D)
N. Not preserved

2. Region No.: I
Sampling Co.: M&E
Sampler (Name): Philleen Odgers
Sampler Signature: [signature]
3. Purpose*
Lead: SF, PRP, ST, [X] FED
Early Action: CLEM, PA, REM, [X] RI, SI, ESI
Long-Term Action: [X] FS, RD, RA, O&M, NPLD

4. Date Shipped:
Carrier: Federal Express
Airbill Number: 8306 0505 9005
5. Ship To: Sentinel Inc. 116 Washington Street, NE Huntsville AL 35801
ATTN: Karen Mitchel/Kelly Fis

6. Date Received -- Received by: 06/13/02 P. Muller
Laboratory Contract Number: 68W00085
Unit Price: 100.00
7. Transfer to:
Date Received:
Received by:
Contract Number:
Price:

CLP Sample Numbers (from labels)	A Matrix (from Box 1) Other:	B Conc.: Low Med High	C Sample Type: Comp./ Grab	D Preservative (from Box 2) Other:	E – RAS Analysis: Diss. Metals	Total Metals	Cyanide	Low only: NO_2/NO_3	Fluoride	High only: pH	Conduct.	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/ Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K High Phases: Solids	Water-Miscible Liq.	Water-Immis. Liq.
MALR32	5	L	C	6		X						169543	TP-4-B	6/10/02 1550	–	P.O.			
MALR33	5	L	C	6		X						169544	TP-2-B	6/10/02 1720	–	P.O.			
MALR34	5	L	C	6		X						169545	TP-3-B	6/10/02 1415	–	P.O.			
			EPA REQUIRE TEMP BLANK INCLUDED																

Shipment for Case Complete? (Y/N): (Y)
Page: 2 of 2
Sample(s) to be Used for Laboratory QC: MALR29 (see Pg. 1)
Additional Sampler Signatures:
Chain of Custody Seal Number(s):

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	6/12/02 1700	Fed Ex airbill no.			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Is custody seal intact? Y/N/none	
		P. Muller	06/13/02 1007		

DISTRIBUTION: Green - Region Copy; White - Lab Copy for Return to Region; Pink - SMO Copy; Yellow - Lab Copy for Return to SMO

EPA Form 9110-1

SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS
*SEE REVERSE FOR PURPOSE CODE DEFINITIONS

A21-012-6 REV. 3/93

169

361177

Attachment III

Validated Sample Result Summary Sheets

U.S. EPA - CLP
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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR20

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45121S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 87.5

EAD 7/12/02

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10100	J		P
7440-36-0	Antimony	2.1	B	UN	P
7440-38-2	Arsenic	6.8			P
7440-39-3	Barium	228			P
7440-41-7	Beryllium	1.4			P
7440-43-9	Cadmium	0.11	U		P
7440-70-2	Calcium	12700	J	E	P
7440-47-3	Chromium	22.8	J	N*	P
7440-48-4	Cobalt	12.2	J		P
7440-50-8	Copper	4520	J	NE	P
7439-89-6	Iron	27600			P
7439-92-1	Lead	100	J	*	P
7439-95-4	Magnesium	3660		E	P
7439-96-5	Manganese	209		*	P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	16.5	J		P
7440-09-7	Potassium	3160		E	P
7782-49-2	Selenium	0.50	U		P
7440-22-4	Silver	1.2	B		P
7440-23-5	Sodium	829	B	J	P
7440-28-0	Thallium	0.80	U		P
7440-62-2	Vanadium	29.0			P
7440-66-6	Zinc	224	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR23

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45122S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 91.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

BAD 7/12/02

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9080	J		P
7440-36-0	Antimony	0.84	UJ	N	P
7440-38-2	Arsenic	4.0			P
7440-39-3	Barium	43.7	B		P
7440-41-7	Beryllium	0.21	B U		P
7440-43-9	Cadmium	0.11	U		P
7440-70-2	Calcium	442	BJ	*E	P
7440-47-3	Chromium	14.3	J	N*	P
7440-48-4	Cobalt	4.6	B		P
7440-50-8	Copper	19.8	J	NE	P
7439-89-6	Iron	13400			P
7439-92-1	Lead	19.1	J	*	P
7439-95-4	Magnesium	2120		E	P
7439-96-5	Manganese	159		*	P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	7.1	BJ		P
7440-09-7	Potassium	1260		E	P
7782-49-2	Selenium	0.77	BJ		P
7440-22-4	Silver	0.24	U		P
7440-23-5	Sodium	483	B		P
7440-28-0	Thallium	0.77	U		P
7440-62-2	Vanadium	18.9			P
7440-66-6	Zinc	35.2	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR24

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45123S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 86.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

EAD 7/12/02

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5870	J		P
7440-36-0	Antimony	0.88	UJ	N	P
7440-38-2	Arsenic	1.3	~~B~~ UJ		P
7440-39-3	Barium	42.8	~~B~~		P
7440-41-7	Beryllium	0.25	~~B~~ UJ		P
7440-43-9	Cadmium	0.12	U		P
7440-70-2	Calcium	1780	J	*E	P
7440-47-3	Chromium	13.5	J	N*	P
7440-48-4	Cobalt	8.4	~~B~~		P
7440-50-8	Copper	17.8	J	~~NE~~	P
7439-89-6	Iron	12300			P
7439-92-1	Lead	2.6	J	*	P
7439-95-4	Magnesium	2160		~~E~~	P
7439-96-5	Manganese	63.8		*	P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	14.7	J		P
7440-09-7	Potassium	2210		~~E~~	P
7782-49-2	Selenium	0.63	~~B~~ J		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	439	~~B~~		P
7440-28-0	Thallium	0.81	U		P
7440-62-2	Vanadium	19.0			P
7440-66-6	Zinc	24.9	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR25

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45124S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 87.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

EXD 7/12/02

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7500	J		P
7440-36-0	Antimony	0.87	U		P
7440-38-2	Arsenic	1.7	B		P
7440-39-3	Barium	69.6			P
7440-41-7	Beryllium	0.18	B	U	P
7440-43-9	Cadmium	0.11	U		P
7440-70-2	Calcium	1410	J		P
7440-47-3	Chromium	19.2	J	N*	P
7440-48-4	Cobalt	10.3	B		P
7440-50-8	Copper	20.9	J	NE	P
7439-89-6	Iron	17300			P
7439-92-1	Lead	3.6	J	*	P
7439-95-4	Magnesium	3280		E	P
7439-96-5	Manganese	112		*	P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	19.3	J		P
7440-09-7	Potassium	3390		E	P
7782-49-2	Selenium	0.50	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	543	B		P
7440-28-0	Thallium	0.80	U		P
7440-62-2	Vanadium	27.8			P
7440-66-6	Zinc	33.7	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR26

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45125S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 88.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

8D
7/12/02

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11400	J		P
7440-36-0	Antimony	0.86	U J	~~N~~	P
7440-38-2	Arsenic	1.4	~~B~~		P
7440-39-3	Barium	72.0			P
7440-41-7	Beryllium	0.12	~~B~~	UJ	P
7440-43-9	Cadmium	0.53	~~B~~		P
7440-70-2	Calcium	650	~~B~~	J ~~*E~~	P
7440-47-3	Chromium	24.9	J	~~N*~~	P
7440-48-4	Cobalt	23.9			P
7440-50-8	Copper	21.0	J	~~NE~~	P
7439-89-6	Iron	14000			P
7439-92-1	Lead	3.0	J	~~*~~	P
7439-95-4	Magnesium	3880		~~E~~	P
7439-96-5	Manganese	103		~~*~~	P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	51.9	J		P
7440-09-7	Potassium	4190		~~E~~	P
7782-49-2	Selenium	0.50	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	454	~~B~~		P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	29.7			P
7440-66-6	Zinc	58.1	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR27

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45126S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 82.8

EXD 7/12/02

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7190	J		P
7440-36-0	Antimony	0.92	U	~~J~~ ~~N~~	P
7440-38-2	Arsenic	1.4	~~B~~	J	P
7440-39-3	Barium	49.2			P
7440-41-7	Beryllium	0.50	~~B~~		P
7440-43-9	Cadmium	0.12	U		P
7440-70-2	Calcium	442	~~B~~	J ~~*E~~	P
7440-47-3	Chromium	15.6	J	~~N*~~	P
7440-48-4	Cobalt	33.3			P
7440-50-8	Copper	12.3	J	~~NE~~	P
7439-89-6	Iron	25800			P
7439-92-1	Lead	3.4	J	~~*~~	P
7439-95-4	Magnesium	2340		~~E~~	P
7439-96-5	Manganese	284		~~*~~	P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	13.3	J		P
7440-09-7	Potassium	2380		~~E~~	P
7782-49-2	Selenium	0.53	U		P
7440-22-4	Silver	0.27	U		P
7440-23-5	Sodium	568	~~B~~		P
7440-28-0	Thallium	1.1	~~B~~	J	P
7440-62-2	Vanadium	22.5			P
7440-66-6	Zinc	33.8	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR28

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45127S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 65.6

EXD 7/12/02

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9450	J		P
7440-36-0	Antimony	4.0	~~B~~	UN	P
7440-38-2	Arsenic	6.5			P
7440-39-3	Barium	2350			P
7440-41-7	Beryllium	0.28	~~B~~	U	P
7440-43-9	Cadmium	0.46	~~B~~		P
7440-70-2	Calcium	8760	J	~~*E~~	P
7440-47-3	Chromium	20.4	J	~~N*~~	P
7440-48-4	Cobalt	7.1	~~B~~	J	P
7440-50-8	Copper	308	J	~~NB~~	P
7439-89-6	Iron	34500			P
7439-92-1	Lead	362	J	~~*~~	P
7439-95-4	Magnesium	3960		~~E~~	P
7439-96-5	Manganese	334		~~*~~	P
7439-97-6	Mercury	0.08	U		CV
7440-02-0	Nickel	18.9	J		P
7440-09-7	Potassium	1270	~~B~~	~~E~~	P
7782-49-2	Selenium	0.89	~~B~~	J	P
7440-22-4	Silver	0.34	~~B~~	J	P
7440-23-5	Sodium	1690	J		P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	17.2			P
7440-66-6	Zinc	788	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR29

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45128S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 88.1

EXD 7/12/02

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9100	J		P
7440-36-0	Antimony	0.86	U	J ~~N~~	P
7440-38-2	Arsenic	6.6			P
7440-39-3	Barium	85.6			P
7440-41-7	Beryllium	0.21	~~B~~	U	P
7440-43-9	Cadmium	0.41	~~B~~		P
7440-70-2	Calcium	2940	J	~~*E~~	P
7440-47-3	Chromium	33.1	J	~~N*~~	P
7440-48-4	Cobalt	4.3	~~B~~		P
7440-50-8	Copper	95.6	J	~~NE~~	P
7439-89-6	Iron	16000			P
7439-92-1	Lead	190	J	*	P
7439-95-4	Magnesium	2070		~~E~~	P
7439-96-5	Manganese	157		~~*~~	P
7439-97-6	Mercury	0.11	~~B~~	J	CV
7440-02-0	Nickel	8.6	~~B~~	J	P
7440-09-7	Potassium	1440		~~E~~	P
7782-49-2	Selenium	0.53	~~B~~	J	P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	575	~~B~~		P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	29.9			P
7440-66-6	Zinc	104	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR30

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45129S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 89.4

EXD 7/12/02

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10600	J		P
7440-36-0	Antimony	0.85	U J N		P
7440-38-2	Arsenic	2.0	B		P
7440-39-3	Barium	143			P
7440-41-7	Beryllium	0.27	B U		P
7440-43-9	Cadmium	0.11	U		P
7440-70-2	Calcium	2540	J	*E	P
7440-47-3	Chromium	16.2	J	N*	P
7440-48-4	Cobalt	5.2	B		P
7440-50-8	Copper	19.6	J	NE	P
7439-89-6	Iron	15100			P
7439-92-1	Lead	277	J	*	P
7439-95-4	Magnesium	2850		E	P
7439-96-5	Manganese	209		*	P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	7.2	B J		P
7440-09-7	Potassium	2740		E	P
7782-49-2	Selenium	0.49	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	539	B		P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	27.9			P
7440-66-6	Zinc	82.8	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR31

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45130S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 88.5

EXD 7/12/02

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8900	J		P
7440-36-0	Antimony	1.0	~~B~~	~~UN~~	P
7440-38-2	Arsenic	8.6			P
7440-39-3	Barium	317			P
7440-41-7	Beryllium	0.27	~~B~~	U	P
7440-43-9	Cadmium	0.51	~~B~~		P
7440-70-2	Calcium	2650	J	~~*E~~	P
7440-47-3	Chromium	17.0	J	~~N*~~	P
7440-48-4	Cobalt	4.7	~~B~~		P
7440-50-8	Copper	106	J	~~NE~~	P
7439-89-6	Iron	15100			P
7439-92-1	Lead	277	J	*	P
7439-95-4	Magnesium	2240		~~E~~	P
7439-96-5	Manganese	161		*	P
7439-97-6	Mercury	0.09	~~B~~	J	CV
7440-02-0	Nickel	9.3	J		P
7440-09-7	Potassium	1790		~~E~~	P
7782-49-2	Selenium	1.3			P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	645	~~B~~		P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	26.4			P
7440-66-6	Zinc	143	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR32

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45131S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 68.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

BJD 7/12/02

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10900	J		P
7440-36-0	Antimony	3.7	~~B~~	~~UJN~~	P
7440-38-2	Arsenic	5.9			P
7440-39-3	Barium	2230			P
7440-41-7	Beryllium	0.19	~~B~~	U	P
7440-43-9	Cadmium	1.7			P
7440-70-2	Calcium	22700	~~J~~	~~*E~~	P
7440-47-3	Chromium	19.4	J	~~N*~~	P
7440-48-4	Cobalt	6.9	~~B~~	J	P
7440-50-8	Copper	1680	J	~~NE~~	P
7439-89-6	Iron	63900			P
7439-92-1	Lead	1250	J	*	P
7439-95-4	Magnesium	3480		~~E~~	P
7439-96-5	Manganese	343		*	P
7439-97-6	Mercury	0.09	~~B~~	J	CV
7440-02-0	Nickel	28.5	J		P
7440-09-7	Potassium	1140	~~B~~	~~E~~	P
7782-49-2	Selenium	0.89	~~B~~	J	P
7440-22-4	Silver	1.1	~~B~~		P
7440-23-5	Sodium	2900			P
7440-28-0	Thallium	1.3	~~B~~	J	P
7440-62-2	Vanadium	16.5			P
7440-66-6	Zinc	1600	J		P
	Cyanide				NR

Color Before: BLACK Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR33

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45132S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 78.4

CAD 7/12/02

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	26200	J		P
7440-36-0	Antimony	5.1	UJB	N	P
7440-38-2	Arsenic	7.1			P
7440-39-3	Barium	3250			P
7440-41-7	Beryllium	0.19	B	J	P
7440-43-9	Cadmium	0.70	B		P
7440-70-2	Calcium	6970	J	E	P
7440-47-3	Chromium	25.5	J	N*	P
7440-48-4	Cobalt	7.7	B	J	P
7440-50-8	Copper	6380	J	NE	P
7439-89-6	Iron	34800			P
7439-92-1	Lead	546	J	N*	P
7439-95-4	Magnesium	2540		E	P
7439-96-5	Manganese	400		*	P
7439-97-6	Mercury	0.12	B	J	CV
7440-02-0	Nickel	56.5	J		P
7440-09-7	Potassium	1470		E	P
7782-49-2	Selenium	0.56	U		P
7440-22-4	Silver	3.8			P
7440-23-5	Sodium	2630	J		P
7440-28-0	Thallium	0.89	U		P
7440-62-2	Vanadium	21.7			P
7440-66-6	Zinc	1690	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MALR34

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 30584 SAS No.: SDG No.: MALR20

Matrix (soil/water): SOIL Lab Sample ID: 45133S

Level (low/med): LOW Date Received: 06/13/02

% Solids: 86.7

EAD 7/12/02

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8090	J		P
7440-36-0	Antimony	0.88	U J	N	P
7440-38-2	Arsenic	4.2			P
7440-39-3	Barium	287			P
7440-41-7	Beryllium	0.25	B	U	P
7440-43-9	Cadmium	0.12	U		P
7440-70-2	Calcium	8730	J	*E	P
7440-47-3	Chromium	11.0	J	N*	P
7440-48-4	Cobalt	3.3	B		P
7440-50-8	Copper	41.2	J	NE	P
7439-89-6	Iron	13000			P
7439-92-1	Lead	51.0	J	*	P
7439-95-4	Magnesium	1490		E	P
7439-96-5	Manganese	148		*	P
7439-97-6	Mercury	0.10	B	J	CV
7440-02-0	Nickel	6.1	B J		P
7440-09-7	Potassium	888	B	E	P
7782-49-2	Selenium	0.51	U		P
7440-22-4	Silver	0.25	U		P
7440-23-5	Sodium	554	B		P
7440-28-0	Thallium	0.81	U		P
7440-62-2	Vanadium	16.2			P
7440-66-6	Zinc	171	J		P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

Attachment IV

Data Validation Worksheets

Region I
Data Review Worksheet

Site Name: Targeted Brownfields Site Assessment Mill St. Property
Reference Number: ~~300100.0006.0015~~

REGION I REVIEW OF INORGANIC
CONTRACT LABORATORY DATA PACKAGE

The hardcopied (laboratory name) Sentinel Inc. data package received at Region I has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No.	30584	SAS No.	N/A	Sampling Date (s)	6/10/02 - 6/12/02
SDG No.	MALR20	Matrix		Shipping Date (s)	6/12/02
No. of Samples	13			Date(s) rec'd by lab	6/13/02

Traffic Report Numbers: MALR20; MALR23; MALR24; MALR25; MALR26; MALR27; MALR28; MALR29; MALR30; MALR31 MALR32; MALR33; MALR34

Trip Blank No.: N/A
Equipment Blank Number: N/A
Field Duplicate Numbers: MALR28 + ~~MALR34~~ (AD MALR33

SOW No. ILM04.1 requires that specific analytical work be done and that associated reports be provided by the laboratory to the Regions, EMSL-LV, and SMO. The general criteria used to determine the performance were based on an examination of:

- OK -Data Completeness
- OK -Holding Times
- ~~OK~~ -Calibrations cal
- -Blanks
- ~~OK~~ -ICP Interference Check Results
- -Matrix Spike Recoveries
- -Laboratory Duplicates
- -Field Duplicates
- OK -Lab Control Sample Results
- OK -Furnace AA results
- OK -ICP Serial Dilution Results
- OK -Detection Limit Results
- -Sample Quantitation

Overall Comments:

Definitions and Qualifiers:

A - Acceptable data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Analyte not detected

Reviewer: Elizabeth DeCoa

Date: 7/2/02

Region I
Inorganic Data Review Worksheets

NO BAD act all criteria met

III A. Instrument Calibration (Section I continued)

CRDL Recovery Criteria (Custom Worksheet)

SM 7/16/02 **Matrix:** Soil

Please list below all analytes not meeting percent criteria in the CRDL standard.

Analyte	Percent Recovery (%)	Actions/Samples Affected
Pb (RDL µg/L 3)	138.0, 120.7	~~No action taken~~ see below
Mercury (0.2)	130.0	~~↓~~ see below

Actions:

1. If %R < 80%, J (+) results, UJ (ND)
2. If %R > 120%, J (+) only
3. J (+) and (UJ) ND samples < 3xCRDL
4. No actions for those samples > 3xCRDL

SM 7/16/02 Pb: J(+) < 3 x CRDL (9 µg/L) NA all SR > 3xCRDL

Hg: J(+) < 3xCRDL (0.6 µg/L)
J(+) MALR29, MALR31, MALR32, MALR33, MALR34

Region I
Inorganic Data Review Worksheets

IV A. BLANK ANALYSIS RESULTS (Sections 1-3)

List the blank contamination in sections 1 and 2 below. A separate worksheet should be used for soil and water blanks.

1. Laboratory Blanks

Matrix: Soil

DATE:	ICB/CCB#	PREP BL	ANALYTE	CONC./UNITS
6/17	ICB		Aluminum	-77.0 ug/L
	CC		Sb	4.4
	ICB		Ba	2.4
	CC+ICB		Be	.3
	CC		Fe	49.9
	CC		Mg	60.0
	ICB		Mn	.7
	CC		Cu	1.9
	ICB		K	32.5
	ICB		V	.8
	ICB		Zn	1.6

2. Equipment/Trip Blanks

DATE:	EQUIP BL #	ANALYTE	CONC./UNITS

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix, for every 20 samples, and for each digestion batch? Yes or No

B. Was a calibration blank run at the beginning of the run, and every 10 samples or every 2 hours whichever is more frequent? Yes or No

If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected:

Region I
Inorganic Data Review Worksheets

IV B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Level for any analyte is equal to 5X the highest concentration of that analyte found in any blank. (Use 5X the absolute value for any negative blank results). The Action Level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL) for that analyte. Specific actions are as follows:

1. When the concentration is greater than the IDL, but less than the Action Level, report the sample concentration detected with a U.

2. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

SM 7/10/02

Matrix: Soil

ELEMENT	MAX. CONC. /UNITS	AL /UNITS
Aluminum	~~77.0 ug/L~~	~~385 ug/L~~
Antimony	4.4 ug/L	22
Barium	2.6 ug/L	13
Beryllium	.3 ug/L	1.5
Iron	49.9 ug/L	249.5
Magnesium	69.0 ug/L	345
Manganese	.7 ug/L	3.5
Copper	1.9 ug/L	9.5
potassium	32.5 ug/L	162.5
Vanadium	.8 ug/L	4
Zinc	1.6 ug/L	8 V

SM 7/12/02

Matrix: Soil

ELEMENT	MAX. CONC/ UNITS	AL/ UNIT
Al	75.4 mg/L	377 mg/L

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

conc. in ug/l X Volume diluted to (200ml) / Weight digested (1gram) X 1L / 1000ml X 1000g / 1kg X 1mg / 1000ug = mg/kg

Multiplying this result by 5 to arrive at the Action Level gives a final result in mg/kg which can then be compared to sample results

MALR20 - Antimony = 8.98 ug/L - U positive

MALR23 ~~Sb~~ Be ~~1.6988 ug/L~~ SM

~~24 Sb 2.3152~~

24 Be 1.0950 U (t)

25 ~~Sb~~ Be ~~1.0292~~

~~26 Sb 1.5920~~

26 Be .51689 U (t)

~~27 Sb 1.8619~~

28 Be .92121 U (t)

~~29 Sb 1.8671 ug/L~~

28 Sb 13.2640 U(t) ug/L

30 Be 1.2167 U(t)

~~30 Sb .61234~~

31 Be 1.1946 U(t)

31 Sb 4.5046 U(t)

32 Be .66285 U(t)

32 Sb 12.659 U(t)

33 Be .73886 U(t)

33 Sb 19.855 U(t)

~~34 Sb 1.4031 U(t)~~

34 Be 1.0799 U(t)

34 [illegible] U(t)

Region I
Inorganic Data Review Worksheets

EAD
~~N/A~~

V B. ICP INTERFERENCE CHECK SAMPLE (Section 3)

3. Report the concentration of any elements detected in the ICS A solution > 2X IDL that should not be present.

ELEMENT	CONC. DETECTED IN THE ICS µg/L	CONC. OF INTERFERENTS IN THE ICS			
		AL	CA	FE	MG
Ba	3				
~~Iron~~				195000	
Cr	-4				
Co	-10				
Cu	29				
Mn	9				
Na	1568				
Vn	-4				
Zn	11				

Estimate the concentration produced by the interfering element in all affected samples. See the guidelines for examples. List the samples affected by the interferences below:

SAMPLE AFFECTED	ELEMENT AFFECTED	SAMPLE CONC. (µg/L)	SAMPLE INTERFERENT CONC. (µg/L)				ESTIMATED. INTERF (µg/L)
			AL	CA	FE	MG	
See attached sheets							

ACTIONS:

1. In general, the sample data can be accepted without qualification if the sample concentrations of Al, Ca, Fe, and Mg are less than 50% of their respective levels in the ICS solution.
2. Estimate (J) positive results for affected elements for samples with levels of interferents 50% or more of that in the ICS solution.
3. Reject (R) positive results if the reported concentration is due entirely to the interfering element.
4. Estimate (UJ) non-detected results for which false negatives are suspect.

Give an explanation for any actions taken below:

See attached sheets.

all results from Raw Data (Mg/L)

MALR20

Fe 120940 mg/L

Na: $\frac{1568}{195000} = \frac{x}{120940}$

$x = 972.5$ J(+) 27% high

Ba: $\frac{3}{195000} = \frac{x}{120,940}$

$x = 1.9$ NA<10%

Vn: $\frac{-4}{195000} = \frac{x}{120940}$

$x = -2.5$ NA<10%

Cr: $\frac{-4}{195000} = \frac{x}{120940}$

$x = -2.5$ NA<10%

Zn: $\frac{11}{195000} = \frac{x}{120940}$

$x = 6.8$ NA<10%

Co: $\frac{-10}{195000} = \frac{x}{120940}$

$x = -6.2$ J(+) low bias

Cu: $\frac{29}{195000} = \frac{x}{120940}$

$x = 18.0$ NA<10%

Mn: $\frac{9}{195000} = \frac{x}{120940}$

$x = 5.6$ NA<10%

all results taken from Raw data Vn: See Cr

MALR27

Mg/L

(for all yellow pages)

Ba: $\frac{3}{195,000} = \frac{x}{106620}$

$x = 1.6$ NA < 10%

Cr: $\frac{-4}{195,000} = \frac{x}{106620}$

$x = -2.19$
-2.2 NA < 10%

Co: $\frac{-10}{195,000} = \frac{x}{106620}$

$x = 5.5$ NA < 10%

Cu: $\frac{29}{195,000} = \frac{x}{106620}$

$x = 16$ J(+) high bias 31.%

10% = 5.09

90% = 45.863

Mn $\frac{9}{195,000} = \frac{x}{106620}$

$x = 4.9$ NA < 10%

Va $\frac{1568}{195,000} = \frac{x}{106620}$ J(+) high bias 36%

$x = 857.3$

Zn: $\frac{11}{195,000} = \frac{x}{106620}$

$x = 6.0$ NA < 10%

MALR28

Ni: $\frac{3}{195,000} = \frac{X}{113,120}$

$X = 1.7$ NA < 10%

Cr: $\frac{-4}{195,000} = \frac{X}{113120}$

$X = -2.3$ NA < 10%

Co: $\frac{-10}{195,000} = \frac{X}{113120}$

$X = -5.8$ J(+) Biased low 25%

Cu: $\frac{29}{195,000} = \frac{X}{113120}$

$X = 1.95$ NA < 10%

Mn $\frac{9}{195,000} = \frac{X}{113120}$

$X = 5.2$ NA < 10%

Na $\frac{1568}{195,000} = \frac{X}{113120}$

$X = 909.6$ J(+) 16% biased high

Vn: See Cr

$X = -2.3$ NA < 10%

Zn: $\frac{11}{195,000} = \frac{X}{113120}$

$X = 6.38$ NA < 10%

MALR 32

Zn. $\frac{11}{195,000} = \frac{x}{218490}$

$x = 12.3$ NA < 10%

Ba. $\frac{3}{195,000} = \frac{x}{218490}$

$x = 3.4$ NA < 10%

Cr $\frac{-4}{195,000} = \frac{x}{218490}$

$x = -4.5$ NA < 10%

Co. $\frac{-10}{195,000} = \frac{x}{218490}$ J(+) 47% bias low

☆ $x = -11.2$

Cu. $\frac{29}{195,000} = \frac{x}{218490}$

$x = 32.5$ NA < 10%

Mn. $\frac{9}{195,000} = \frac{x}{218490}$

$x = 10.1$ NA < 10%

Na $\frac{1568}{195000} = \frac{x}{218490}$

$x = 636.4$ NA < 10%

Vn. $\frac{-4}{195,000} = \frac{x}{\cancel{120940}\ 218490}$

$x = -4.5$ NA < 10%

~~MALR~~ all results taken from Raw Data
all in ug/L

MALR33

Ba: $\frac{3}{195,000} = \frac{X}{136510}$

$X = 2.1$ NA <10%

Na: $\frac{1568}{195000} = \frac{X}{136510}$

* $X = 1097$ J(4) 10.6% high Bias

Cr $\frac{-4}{195,000} = \frac{X}{136510}$

$X = -2.8$ NA <10%

Vn: $\frac{-4}{195,000} = \frac{X}{\cancel{12940}\ 136510}$

$X = -2.8$ NA <10%

Co $\frac{-10}{195,000} = \frac{X}{136510}$

* $X = -7.0$ J(4) 23% Low Bias

Zn: $\frac{11}{195000} = \frac{X}{136510}$

$X = 7.7$ NA <10%

Cu: $\frac{29}{195000} = \frac{X}{136510}$

$X = 20.3$ NA <10%

Mn: $\frac{9}{195,000} = \frac{X}{136510}$

$X = 6.3$ NA <10%

~~17~~