ER Library
EG+G Mound

Control Copy No: 13

Update Package 1 Content List

5 December 1996

Method Number	Revision	Description	Source
A-001	2.0	CLP Volatile Organic Analyses—CLP SOW OLMO1.8	QAPP
A-002	2.0	Volatiles Organic Analysis—EPA Method SW8021	QAPP
A-003	2.0	CLP Semi-Volatile Analysis—CLP SOW OLMO1.8	QAPP
A-023	1.0	Total Petroleum Hydrocarbon, EPA 418.1	Compendium
Q-004	1.0	Laboratory Data Reduction	QAPP
Q-005	1.0	Laboratory Data Reporting—Tier III—Complete Data Package	QAPP
Q-006	1.0	Validation of Laboratory Data Packages	QAPP
Q-007	1.0	Data Assessment	QAPP
Q-008	1.0	Data Integrity Verification	QAPP
Q-009	1.0	Field Data Validation	QAPP
Q-012	1.0	Electronic Data Deliverable Format Specification—MEIMS Non-CLP Standard Format	Compendium
Q-013	1.0	Electronic Data Deliverable Format Specification—MEIMS Alternate Non-CLP Format—RTL	Compendium
Q-014	1.0	Laboratory Data Reporting—Tier II—Data Summary Report	QAPP
TOC 1	1.0	Revised Table of Contents for Compendium	NA
TOC 2	1.0	Revised Table of Contents for Analytical Methods Section	NA
TOC 3	1.0	Revised Table of Contents for Quality Assurance Section	NA

Response to United States EPA Comments
on
the Mound Plant Methods Compendium

1. Method A-001, Page 1, Section 1.1 - Description

   Method A-001 will be revised and re-issued with the addition of vinyl acetate to the last sentence in the section.

2. Method A-001, Page 8, Exhibit D, Section 7.4.6, Second Sentence

   The previously approved OU9 QAPP specified the maximum percent RSD as 20.5 percent. No corrective action report or plan change notice was filed during the OU9 project to document changing the maximum percent RSD to 25 percent. However, we concur that the value should have been listed as 25 percent and the method will be revised.

3. Method A-003, Page 2, Section 4, Table 4.1

   The previously approved OU9 QAPP specified the acceptance criteria for aqueous SVOC field duplicates as 55 percent on page 3-15. While a tighter limit on precision may at first appear to result in improved data quality, the change may actually result in additional qualifications of data which are perfectly usable based on the original data quality objectives identified during the development of the OU9 QAPP. Therefore, this recommended change has not been implemented.

4. Method A-003, Page 4, Section 5, Table 5.1

   Residential well CRDLs and quality assurance requirements should have been eliminated from the method. Residential well sampling was performed under the OU9 Investigation and no further residential well sampling is currently scheduled. The method will be revised to eliminate references to residential wells.

5. Method A-003, Page 4, Section 5, Table 5.1

   The entry for 2,2'-oxybis(1-chloropropane) was revised to 2,2'-oxybis(1-chloropropane)[1].*

6. Method A-003, Page 9, Exhibit C, Residential Well Table

   Residential well CRDLs and quality assurance requirements should have been eliminated from the method. Residential well sampling was performed under the OU9 Investigation and no further residential well sampling is currently scheduled. The method will be revised to eliminate references to residential wells.

7. Method A-003, Page 11, Exhibit D, Section IV, Part 3.2

   Benzyl alcohol was added to the calibration solution specifications in Part 3.2 of Section IV of Exhibit D on page 11 of method A-003.

Table of Contents

ANALYTICAL METHODS — TABLE OF CONTENTS

QUALITY ASSURANCE METHODS — TABLE OF CONTENTS

MOUND

Environmental
Restoration
Program

Method: A-001

Volatile Organic Analysis by CLP SOW OLM01.8

Revision 2.0

Mound Plant
Miamisburg, OH

Source Document: QAPP (April 1995)

1. INTRODUCTION

1.1 Description

Soil/sediment and surface water samples will be analyzed for VOCs by the CLP SOW using gas chromatography and mass spectometry as a means for compound identification. Capillary columns as specified in the method will be employed. A modification to the CLP SOW (Attachment A) has been prepared to account for seven additional volatile organic compounds: acrylonitrile, acetonitrile, trichlorotrifluoroethane, iodomethane, hexane, vinyl acetate, and 1,2-diethylbenzene.

1.2 References

EPA 1990a. "U.S. EPA Contract Laboratory Program, Statement of Work for Organic Analysis, Multimedia, Multi-Concentration." Document No. ILM1.0 including Revisions 1.1 through 1.8. Environmental Protection Agency, March, 1990.

DOE 1995. "Remedial Investigation/Feasibility Study Operable Unit 9, Site-Wide Quality Assurance Project Plan," Final Revision 4, U.S. Department of Energy, April 1995.

2. PRESERVATION

Table 2.1 - Volatile Organic Analysis - CLP SOW OLM01.8 Sample Containers, Volumes, Preservation, and Holding Times

Matrix	Parameters	Analytical Method	Container	Minimum Volume	Preservation	Holding Time
Water	Volatile Organic Compounds	CLP SOW	Glass vial with Teflon-lined septum (no headspace)	Two 40 mL vials	HCl to pH≤2 Cool 4°C	14 days
Soil	Volatile Organic Compounds	CLP SOW	Glass bottle with Teflon-lined septum	120 mL (no headspace)	Cool 4°C	14 days

3. CALIBRATION

Gas Chromatograph/Mass Spectrometry (GC/MS) will be used for analysis of volatile organic compounds. Mass spectral abundance criteria must be met prior to sample analysis. Bromofluorobenzene (BFB) is used to verify instrument performance of the GC/MS system and must meet specific ion abundance criteria established in the CLP SOW. Meeting these criteria is demonstrated daily or once during every 12-hour time period, whichever is more frequent. The instrument performance is also verified whenever a corrective action to the GC/MS system is taken that affects the tuning (e.g., ion source cleaning or repair).

Initial calibration of the GC/MS system is accomplished with a minimum of five concentrations of target compounds. Relative Response Factors (RRFs) must be greater than or equal to 0.05. Relative standard deviations for the RRFs must be less than or equal to 30%. Initial calibration is

not valid if this criterion is not met. The relative retention times of each compound in each standard run must agree within 0.06 units.

The initial calibration is verified every 12-hour period with a continuing calibration standard containing all target volatile compounds and surrogate compounds. RRFs are compared to the average RRF from the initial calibration. The minimum RRF for the target compounds must be met. The percent difference between the initial RRFs and the continuing RRF must be less than or equal to 25 percent for the initial calibration to be valid. Prior to sample analysis, the GC/MS system is evaluated and corrective action taken if these criteria are not met.

4. QC CRITERIA

Table 4.1 - Volatile Organic Analysis CLP SOW OLM01.8 Field QC Sample Frequency

Parameter	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
VOA, CLP SOW	Trip Blank	1 per shipping container to lab	≤ 10 x level in associated samples	Evaluate potential sources; Evaluate associated data for usability.
	Equipment (rinsate) blank	1 every 10 or fewer field samples (water)	≤ 10 x level in associated samples	Evaluate potential sources; Evaluate associated data for usability.
	Sample bank blank	1 every 20 or fewer field samples	≤ 10 x level in associated samples	Evaluate potential sources; Evaluate associated data for usability.
	Ambient blank	1 every 20 or fewer field samples	≤ 10 x level in associated samples	Evaluate potential sources; Evaluate associated data for usability.
	Field Duplicate	1 every 10 or fewer field samples (water) 1 every 10 or fewer field samples (soil)	≤ 25% RPD N/A	Evaluate data for usability. Evaluate variability.

Table 4.2 - Volatile Organic Analysis CLP SOW OLM01.8 Laboratory QC Sample Frequency

Parameter	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
VOA, CLP SOW	Method Blank	Once per 12-hour period	≤ 5 x CRQL of common lab contaminants ≤ CRQL others	Investigate source; reanalyze associated samples.
	Matrix Spike	1 per 20 samples of a given matrix in a case or fewer; see CLP SOW	See Table 4.3	Evaluate data for usability.
	Matrix spike duplicate	1 per 20 samples of a given matrix in a case or fewer; see CLP SOW	See Table 4.3	Evaluate data for usability.
	Laboratory control sample	Once per 12-hour period	See Table 4.3	Evaluate associated data for usability.
	System monitoring compounds	All lab and field samples	CLP SOW	See CLP SOW.
	Instrument performance check	Daily or each 12-hour period, whichever is more frequent	CLP SOW	Retune: Reanalyze associated samples
	Calibration	CLP SOW	±0.06 relative retention time units (sample and standard)	Recalibrate before sample analysis
	Retention time window	CLP SOW	CLP SOW	See CLP SOW.
	Qualitative verification	When a detection occurs in a sample	CLP SOW	See CLP SOW.
	Calibration check	With every calibration	CLP SOW	Recalibrate.
	Internal standard	Every standard and sample	CLP SOW	See CLP SOW.
	Continuing calibration check	Once each 12-hour period	CLP SOW	Identify source and correct. Recalibrate if source not found and corrected.

Table 4.3 - Volatile Organic Analysis CLP SOW OLM01.8 Laboratory Surrogate and Matrix Spike Limits

Analytical Method	Spiking Compounds	Spike Concentration		Advisory Limits Percent Recovery		Advisory Limits Relative Percent Difference (%)	
		Water (µg/L)	*Soil (µg/kg)*	*Water*	*Soil*	*Water*	*Soil*
CLP SOW	*Matrix Spike/LCS*						
Volatile Organic Compounds	1,1-DCE	per CLP SOW	per CLP SOW	61-145	59-172	≤14	≤22
	Trichloroethene	per CLP SOW	per CLP SOW	71-120	62-137	≤14	≤24
	Benzene	per CLP SOW	per CLP SOW	76-127	66-142	≤11	≤21
	Toluene	per CLP SOW	per CLP SOW	76-125	59-139	≤13	≤21
	Chlorobenzene	per CLP SOW	per CLP SOW	75-130	60-133	≤13	≤21
	Surrogates						
	Toluene-d8	per CLP SOW	per CLP SOW	88-110	84-138	NA	NA
	4-Bromo-fluorobenzene	per CLP SOW	per CLP SOW	86-115	59-113	NA	NA
	1,2-Dichloroethane-d4	per CLP SOW	per CLP SOW	76-114	70-121	NA	NA

5. ANALYTE LIST AND REPORTING LIMITS

These are expected quantitation limits based on reagent grade water or a purified solid matrix. Actual quantitation limits may be higher depending upon the nature of the sample matrix. The limit reported on final laboratory reports will take into account the actual sample volume or weight, percent moisture (where applicable), and the dilution factor, if any.

Table 5.1 - Volatile Organic Analysis CLP SOW OLM01.8 Target Analyte List

Analyte	Water (µg/L)	Soil (µg/kg)
Chloromethane	10	10
Bromomethane	10	10
Vinyl Chloride	10	10
Chloroethane	10	10
Methylene chloride	5	5
Acetone	10	10
Carbon disulfide	5	5
1,1-Dichloroethene	5	5
1,1-Dichloroethane	5	5
1,2-Dichloroethene (total)	5	5
Chloroform	5	5
1,2-Dichloroethane	5	5
2-Butanone	10	10
1,1,1-Trichloroethane	5	5
Carbon Tetrachloride	5	5
Bromodichloromethane	5	5
1,2-Dichloropropane	5	5
cis-1,3-Dichloropropene	5	5
Trichloroethene	5	5
Dibromochloromethane	5	5
1,1,2-Trichloroethane	5	5
Benzene	5	5
trans-1,3-Dichloropropene	5	5
Tribromomethane	5	5
4-Methyl-2-pentanone	10	10
2-Hexanone	10	10
Tetrachloroethene	5	5
Toluene	5	5
1,1,2,2-Tetrachloroethane	5	5
Chlorobenzene	5	5
Ethylbenzene	5	5
Styrene	5	5
Xylenes (total)	5	5
Additional Compounds:		
Acrylonitrile	100	100
Acetonitrile	100	100
Diethylbenzene	5	20
Trichlorotrifluoroethane	5	10
Hexane	10	10
Iodomethane	NA	10
Vinyl Acetate	10	10

ATTACHMENT TO METHOD A-001

Attachment to Method A-001

Modification to CLP Organic SOW OLM01.8
"Statement of Work for Organic Analysis,
Multi-media, Multi-concentration"

The purpose of this addendum is to outline modifications to the Contract Laboratory Program (CLP) "Statement of Work for Organic Analysis, Multi-media, Multi-concentration" which are project specific to the QAPP prepared by Roy F. Weston, Inc. for investigative activities at the Department of Energy/LANL Mound Plant, Miamisburg, Ohio.

This addendum extends the analysis to include acetonitrile, acrylonitrile, 1,2-diethylbenzene, hexane, iodomethane 1,1,2-trichloro-1,2,2-trifluoroethane, and vinyl acetate for volatiles.

Exhibit A - Summary of Requirements

No modifications to this section.

Exhibit B - Reporting and Deliverables Requirements

Section I: Contract Reports/Deliverables Distribution
No modifications to this section.

Section II: Report Descriptions and Order of Data Deliverables
No modifications to this section.

Section III: Form Instructions
No modifications to this section.

Section IV: Data Reporting Forms:
The following compounds must be added on Form I (Data Sheets).

CAS No.	Analyte
75-05-8	Acetonitrile
107-13-1	Acrylonitrile
76-13-1	1,2,2-Trichloro-1,2,2-trifluoroethane
74-88-4	Iodomethane
110-54-3	Hexane
135-01-3	1,2-Diethylbenzene
108-05-04	Vinyl acetate

Form VI VOA (Initial Calibration), and Form VII VOA (Continuing Calibration) must be modified to include these additional seven VOA compounds.

Exhibit C - Target Compound List (TCL) and Contract Required Quantitation Limits(CRQL)

The following should be added to the Target Compound List (TCL) and Contract required Quantitation Limits (CRQL, Page C-2 and Page C-4):

Analyte	CAS No.	CRQL			On Col. (ng)
		Low Water ug/L	Low Soil ug/kg	Med. Soil ug/kg	
Acetonitrile	75-05-8	100	100	6000	300
Acrylonitrile	107-13-1	100	100	6000	300
1,2,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5	10	1200	50
Iodomethane	74-88-4	NA	10	1200	50
Hexane	110-54-3	10	10	1200	50
1,2-Diethylbenzene	135-01-3	5	20	1200	50
Vinyl acetate	108-05-04	10	10	1200	50

Form III

VOA-1 Water: Add: Acrylonitrile and acetonitrile QC Limits for Recovery 70-130% and RPD 15%.

VOA-2 Soil: Add: Acrylonitrile and acetonitrile QC Limits for Recovery 60-140% and RPD 25%.

Exhibit D - Analytical Methods for Volatiles:

Section I: Introduction:

1.1 Scope and Application: No modifications to this section

1.2 Problems: This section is modified to include:

- Acetonitrile may have poor purge efficiency;
- Iodomethane can be easily degraded.

Section II: Sample Preparation and Storage

No modifications to this section.

Section III: Optional Screening

No modifications to this section.

Section IV: GC/MS Analysis of Volatiles:

1. Summary of Methods: No modifications to this section.
2. Interferences: No modifications to this section.
3. Apparatus and Materials: No modifications to this section.
4. Reagents: No modifications to this section.
5. Standards:

5.1 - 5.4 The above seven additional compounds must be added to the TCL of standards for preparation of stock standard solutions, secondary dilution standards, and working standards.

5.4.5 Add: Acrylonitrile is be added to the matrix spike solution at a concentration of 250 ug/L.

5.5 Aqueous Calibration Standard Solutions

5.5.1 Prepare five aqueous initial calibration standard solutions containing all purgeable TCL and additional compounds and system monitoring compounds at 10, 20, 50, 100, 200 ug/L levels except acetonitrile and acrylonitrile which will be prepared at 50, 100, 250, 500, 1000 ug/L.

5.5.2 No modifications to this section.

5.5.3 The 50 ug/L aqueous calibration standard solution for all TCL except acetonitrile and acrylonitrile which will be at 250 ug/L is the continuing calibration solution.

5.6 No modifications to this section.

6. Instrument Operating Conditions:

6.1 No modifications to this section.

6.2.1 Final hold time is changed to "Until all target compounds elute."

6.3 and 6.4 No modifications to this section.

7. Calibration:

7.1 - 7.4.5 No modifications to this section.

7.4.6 The additional compounds acetonitrile, acrylonitrile, 1,2-diethylbenzene, hexane, iodomethane, vinyl acetate, and 1,1,2-trichlorotrifluoroethane must be added to the list of compounds. The maximum %RSD of 25 and maximum percent difference of 25 is acceptable for all the additional compounds, except acetonitrile and acrylonitrile. Acetonitrile may have a maximum %RSD of 35 and acrylonitrile may have a maximum %RSD of 30. The maximum percent difference for acetonitrile and acrylonitrile is 30. However, these compounds must meet the minimum RRF criteria of 0.01.

These are advisory limits and final limits will be established after method validation.

7.4.7 - 7.4.8 No modifications to this section.

7.5 - 7.9 No modifications to this section.

8. Sample Analysis:

8.1.1 -8.1.15 No modifications to this section.

8.1.16 Add: The concentration of acrylonitrile, the additional matrix spike compound is 250 ug/L.

8.1.17 - 8.1.18 No modifications to this section.
8.2.1.1 - 8.2.1.7 No modifications to this section.
8.2.1.8 Add: The concentration of the additional matrix spike compound acrylonitrile would be 250g/kg.
8.2.1.9 - 8.2.1.10 No modifications to this section.
8.2.2.1 - 8.2.2.8 No modifications to this section.
8.2.2.9 Add: The resulting concentration of the additional matrix spike compound in the soil is 31,250 ug/kg.
9. Qualitative Analysis: No modifications to this section.
10. Quantitative Analysis: No modifications to this section.

Table 3 No modifications to this section.

Table 4 The following is added to Table 4:

Analyte	Primary Ion	Secondary Ions
Acetonitrile	41	40
Acrylonitrile	53	52,51
1,1,2-Trichlorotrifluoroethane	101	103, 151,153
Iodomethane	142	127
Hexane	57	86,43,41
1,2-Diethylbenzene	119	134, 115
Vinyl Acetate	43	86

Table 5 Add: The additional compounds acetonitrile, acrylonitrile, 1,2-diethylbenzene, hexane, iodomethane, vinyl acetate and 1,1,2-trichlorotrifluoroethane must be quantitated using the nearest eluting internal standard.

Table 6 No modifications to this section.

Table 7 Add:

	Water		Soil	
Compound	% Recovery	RPD	% Recovery	RPD
Acetonitrile	70-130	15	60-140	25
Acrylonitrile	70-130	15	60-140	25

Exhibit E - QA/QC Requirements

I. Overview:
No modifications to this section.

II. Quality Assurance Plan:
No modifications to this section.

III. Standard Operating Procedure:
No modifications to this section.

IV. QA/QC Requirements: Volatile QA/QC requirements

1. GC/MS Mass Calibration and Ion Abundance Patterns:
   No modifications to this section.
2. GC/MS Initial Calibration:
   Reference to Exhibit D includes the modifications to Exhibit D presented in this addendum.
3. Continuing Calibration:
   Reference to Exhibit D includes the modifications to Exhibit D presented in this addendum.
4. Internal Standards Responses and Retention Times:
   No modifications to this section.
5. Method Blank Analysis:
   No modifications to this section.
6. System Monitoring Compound Recoveries:
   No modifications to this section.
7. Matrix Spike and Matrix Spike Duplicate Analysis:
   Reference to Exhibit D includes the modifications to Exhibit D presented in this addendum.
8. Dilution of Samples, MS and MSD
   No modifications to this section.

V Analytical Standards Requirements
No modifications to this section.

VI Contract Compliance Screening
No modifications to this section.

VII Regional Data Review
No modifications to this section.

VIII Laboratory Evaluation Samples
No modifications to this section.

IX GC/MS Tape Audits
No modifications to this section.

X Data Package Audits
No modifications to this section.

XI On Site Laboratory Evaluations
No modifications to this section.

XII Quality Assurance and Data Management
No modifications to this section.

XIII Data Management
No modifications to this section.

Exhibit F - Chain-of-Custody, Document Control, and Standard Operating Procedures

No modifications to this section.

Exhibit G - Glossary of Terms

No modifications to this section.

Exhibit H - Data Dictionary and Format for Data Deliverables in Computer-Readable Format

No modifications to this section.

MOUND

Environmental
Restoration
Program

Method: A-002

Volatiles Organic Analysis/ EPA Method 8021

Revision 2.0

Mound Plant
Miamisburg, OH

Source Document: QAPP (April 1995)

1. INTRODUCTION

1.1. Description

Groundwater samples will be analyzed for halogenated and aromatic VOCs using gas chromatography with a Hall electrolytic conductivity detector and a photoionization detector. The methodology to be followed is EPA Method 8021 (EPA 1987). This method was chosen over the CLP SOW for groundwater samples in order to achieve lower detection limits. Because some of the additional VOCs may coelute with other compounds on the specified capillary column, a Gas Chromatography/Mass Spectrometry (GC/MS) confirmation or second column confirmation will be performed for any detection at the same retention times. If GC/MS confirmation is used, then the data must be reported per the CLP specification as described in Subsection 9.2.3 of the OU9 site-wide QAPP (DOE 1995).

1.2. References

EPA. 1986. "Test Methods for Evaluating Solid Waste." Laboratory Manual/Physical Methods, SW-846, Volumes 1A, 1B and 1C, third edition. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. November 1986.

EPA. 1987. "Test Methods for Evaluating Solid Waste." Laboratory Manual/Physical Methods, SW-846, Volumes 1A, 1B and 1C, third edition. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. December 1987.

EPA. 1990. "Test Methods for Evaluating Solid Waste." Laboratory Manual/Physical Methods, SW-846, Volumes 1A, 1B and 1C, third edition. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. March 1990.

DOE 1995. "Remedial Investigation/Feasibility Study Operable Unit 9, Site-Wide Quality Assurance Project Plan," Final Revision 4, U.S. Department of Energy, April 1995.

2. PRESERVATION

Volatile Organic Analysis - EPA Method 8021
Sample Containers, Volumes, Preservation, and Holding Times

Matrix	Parameters	Analytical Method	Container	Minimum Volume	Preservation	Holding Time
Water	Volatile Organic Compounds	SW5030/SW8021	Glass vial with Teflon-lined septum (no headspace)	Two 40 mL vials	HCl to pH<2 Cool 4°C	14 days

3. CALIBRATION

Gas chromatography will be used for analysis of volatile organic compounds in groundwater (Methods SW-8021). Initial calibration is performed when chromatographic conditions are changed (e.g., change in flow rate, detectors, new column). A minimum of five external standards for volatile organic analysis are analyzed to determine the linearity of the gas chromatograph. Response factors for each compound are calculated (as specified in the methods) from the results, and a calibration curve generated. Linearity criteria for volatile organic compounds (VOCs) are valid if there is less than or equal to 20% relative standard deviation among the calibration factors. A quadratic curve may also be used.

The linearity of the gas chromatograph for volatile organic analysis is checked by analysis of a check standard after every 10 sample analyses. The response for any analyte must be within a 15% difference of the response from the initial calibration. If the percent difference exceeds this criterion, then the instrument is checked and a new calibration curve is performed before samples are analyzed.

Retention time windows for VOCs are established when a column is changed or after other changes are made in instrument conditions that will alter the retention times of the analytes of interest. The windows are established according to procedures defined in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, USEPA (EPA 1987).

4. QC CRITERIA

Table 4.1 - Volatile Organic Analysis - EPA Method 8021 Field QC Sample Frequency

Parameter	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
VOC, SW8021	Trip Blank	1 per shipping container to lab	≤ 10 x level in associated samples	Evaluate potential sources; Evaluate associated data for usability.
	Equipment (rinsate) blank	1 every 10 or fewer field samples (**water**)	≤ 10 x level in associated samples	Evaluate potential sources; Evaluate associated data for usability.
	Sample bank blank	1 every 20 or fewer field samples	≤ 10 x level in associated samples	Evaluate potential sources; Evaluate associated data for usability.
	Ambient blank	1 every 20 or fewer field samples	≤ 10 x level in associated samples	Evaluate potential sources; Evaluate associated data for usability.
	Field Duplicate	1 every 10 or fewer field samples (**water**)	≤ 35% RPD	Evaluate data for usability.

Table 4.2 - Volatile Organic Analysis - EPA Method 8021 Laboratory QC Sample Frequency

Parameter	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
VOC, SW8021	Method Blank	1 per 20 samples of a given matrix or 1 whenever a batch of samples is prepared in a day, whichever is more frequent.	≤ PQL	Identify and correct source. Reanalyze blank and associated samples.
	Calibration	5 points; when calibration check criteria exceeded.	≤ 20% RSD for calibration factors	Recalibrate
	Calibration check	Once per 10 samples analyzed.	± 15% from initial response factor	Recalibrate
	Matrix spike	1 per 20 samples of a given matrix	See Table 4.3	Evaluate data for usability.
	Matrix spike duplicate	1 per 20 samples of a given matrix	See Table 4.3	Evaluate data for usability.
	Surrogate spikes	All field and lab samples	See Table 4.3	Check calculations, surrogate and standard solutions, and instrument. If problem not identified then reanalyze sample.
	Retention time window	When new column installed and as needed	±3 x SD of three retention times for each analyte as per SW 846.	Identify source, correct problem.
	Laboratory control sample (LCS)	1 per 20 samples of a given matrix or 1 whenever a batch of samples is prepared in a day, whichever is more frequent.	See Table 4.3	Identify and correct problem prior to further sample analyses, reanalyze.

Table 4.3 - Volatile Organic Analysis - EPA Method 8021 Laboratory Surrogate and Matrix Spike Limits

Analytical Method	Spiking Compounds	Spike Concentration		Advisory Limits Percent Recovery		Advisory Limits Relative Percent Difference (%)	
		Water (µg/L)	*Soil (µg/kg)*	*Water*	*Soil*	*Water*	*Soil*
	Matrix Spike/LCS						
Volatile Organic Compounds, SW8021	Bromodichloromethane	*	*	42-172	NA	≤15	NA
	Bromoform	*	*	13-159	NA	≤15	NA
	Carbon tetrachloride	*	*	43-143	NA	≤15	NA
	Chloroform	*	*	49-133	NA	≤15	NA
	Dibromochloromethane	*	*	24-191	NA	≤15	NA
	1,4-Dichlorobenzene	*	*	42-143	NA	≤15	NA
	1,2-Dichloroethane	*	*	51-147	NA	≤15	NA
	1,1-Dichloroethene	*	*	28-167	NA	≤15	NA
	1,1,1-Trichloroethane	*	*	41-138	NA	≤15	NA
	Trichloroethene	*	*	35-146	NA	≤15	NA
	Vinyl Chloride	*	*	28-163	NA	≤15	NA
	Benzene	*	*	39-150	NA	≤15	NA
	Surrogates						
	Bromochloromethane	30	30	59-117	70-130	≤15	≤30
	Fluorobenzene	30	30	48-120	70-130	≤15	≤30
	1,4-dichlorobutane	30	30	60-140	60-140	≤15	≤15
	2-bromo-1-chloropropane	30	30	60-140	60-140	≤15	≤15

5. ANALYTE LIST AND REPORTING LIMITS

These are expected quantitation limits based on reagent grade water or a purified solid matrix. Actual quantitation limits may be higher depending upon the nature of the sample matrix. The limit reported on final laboratory reports will take into account the actual sample volume or weight, percent moisture (where applicable), and the dilution factor, if any.

Table 5.1
Volatile Organic Analysis - EPA Method 8021
Target Analyte List

Analyte	Water (µg/L)	Soil (µg/kg)
Vinyl chloride	1.0	NA
Trichlorofluoromethane	2.0	NA
1,1-dichloroethene	1.3	NA
Methylene chloride (dichloromethane)	5.0	NA
1,1-dichloroethane	0.7	NA
Trichloromethane (chloroform)	0.5	NA
1,1,1-trichloroethane	0.3	NA
Carbon tetrachloride	1.2	NA
1,2-dichloroethane	0.3	NA
Trans-1,2-dichloroethene	1.0	NA
Trichloroethene	1.2	NA
1,2-dichloropropane	0.4	NA
Bromodichloromethane	1.0	NA
Dibromomethane	2.0	NA
1,1,2-trichloroethane	0.2	NA
Tetrachloroethene	0.3	NA
Dibromochloromethane	0.9	NA
Chlorobenzene	2.5	NA
1,1,1,2-tetrachloroethane	1.0	NA
Bromoform	2.0	NA
1,1,2,2-tetrachloroethane	0.3	NA
1,2,3-trichloropropane	1.0	NA
Phenyl bromide (bromobenzene)	2.0	NA
Chlorotoluene	1.0	NA
1,3-dichlorobenzene	3.2	NA
1,4-dichlorobenzene	2.4	NA
1,2-dichlorobenzene	1.5	NA
Benzene	2.0	NA
Chlorobenzene	2.0	NA
1,2-Dichlorobenzene	4.0	NA
1,3-Dichlorobenzene	4.0	NA
1,4-Dichlorobenzene	3.0	NA
Ethylbenzene	2.0	NA
Toluene	2.0	NA
Xylene	2.0	NA
Additional Compounds:		
Cis-1,2-dichloroethene	1.0	NA
2-chloroethyl vinyl ether	1.3	NA
Cis-1,3-dichloropropene	3.4	NA
Additional Compounds:		
Trans-1,3-dichloropropene	3.4	NA
1-chlorohexane	1.0	NA

Table 5.1
Volatile Organic Analysis - EPA Method 8021
Target Analyte List

Analyte	Water (µg/L)	Soil (µg/kg)
Bis(2-chloroisopropyl)ethyl	20	NA
Trichlorotrifluoroethane	2	NA
Diethylbenzene	1	NA
Vinyl acetate	3	NA
Carbon disulfide	5	NA
Acetone	20	NA
Methylethyl ketone (2-butanone)	10	NA
Methylisobutyl ketone (4-methyl-2-pentanone)	5	NA

MOUND

Environmental
Restoration
Program

Method: A-003

CLP Semi-Volatile Analysis/ CLP SOW OLM01.8

Revision 2.0

Mound Plant
Miamisburg, OH

Source Document: QAPP (April 1995)

1. INTRODUCTION

1.1 Description

Soil/sediment and water samples will be analyzed for semi-volatile organic compounds by the EPA CLP SOW Document Number OLOM01.8 (EPA, 1990a), using Gas Chromatography/Mass Spectrometry (GC/MS). A modification to the CLP SOW (Attachment A and B) has been prepared to specify criteria for three additional analytes: benzoic acid, 2-benzyl-4-chlorophenol, and benzyl alcohol.

1.2 References

U.S. EPA Contract Laboratory Program, Statement of Work for Organic Analysis, Multimedia, Multi-Concentration. Document No. OLM01.8.

DOE 1995. "Remedial Investigation/Feasibility Study Operable Unit 9, Site-Wide Quality Assurance Project Plan," Final Revision 4, U.S. Department of Energy, April 1995.

2. PRESERVATION

Table 2.1 - Semi-Volatile Organic Analysis - CLP SOW OLM01.8 Sample Containers, Volumes, Preservation, and Holding Times

Matrix	Parameters	Analytical Method	Container	Minimum Volume	Preservation	Holding Time
Water	Semi-Volatile Organic Compounds	CLP SOW	Amber glass bottle with Teflon-lined lid	Two 1000 mL bottles	Cool 4°C	7 days extraction/ 40 days analysis
Soil	Semi-Volatile Organic Compounds	CLP SOW	Amber glass bottle with Teflon-lined lid	100 grams	Cool 4°C	14 days extraction/ 40 days analysis

3. CALIBRATION

GC/MS will be used for analysis of semi-volatile organic compounds. Mass spectral abundance criteria must be met prior to sample analysis. Decafluorotriphenylphosphine (DFTPP) is used to verify instrument performance of the GC/MS system and must meet specific ion abundance criteria established in the CLP SOW. Meeting these criteria is demonstrated daily or once during every 12-hour time period, whichever is more frequent. The instrument performance is also verified whenever a corrective action to the GC/MS system is taken that affects the tuning (e.g., ion source cleaning or repair).

Initial calibration of the GC/MS system is accomplished with a minimum of five concentrations of target compounds. Only a four point calibration is required by the CLP SOW for eight of the target semi-volatile compounds that have higher CRQLs. Relative response factors (RRFs) must

be greater than or equal to 0.05. Relative standard deviations for the RRFs must be less than or equal to 30%. Initial calibration is not valid if this criterion is not met. The relative retention times of each compound in each standard run must agree within 0.06 units.

The initial calibration is verified every 12-hour period with a continuing calibration standard containing all target semi-volatile surrogate compounds. RRFs are compared to the average RRF from the initial calibration. The minimum RRF for the target compounds must be met. The percent difference between the initial RRFs and the continuing RRF must be less than or equal to 25 percent for the initial calibration to be valid. Prior to sample analysis, the GC/MS system is evaluated and corrective action taken if these criteria are not met.

4. QC CRITERIA

Table 4.1 - Semi-Volatile Organic Analysis - CLP SOW OLM01.8 Field QC Sample Frequency

Parameter	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
SVOC, CLP SOW	Equipment (rinsate) blank	1 every 10 or fewer field samples (water)	≤ 10 × level in associated samples	Evaluate variability
	Field Duplicate	1 every 10 or fewer field samples (water)	≤ 55% RPD	Evaluate data for usability
		1 every 10 or fewer field samples (soil)	Not applicable	Evaluate variability

Table 4.2 - Semi-Volatile Organic Analysis - CLP SOW OLM01.8 Laboratory QC Sample Frequency

Parameter	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
VOA, CLP SOW	Method Blank	1 per 20 samples of a given matrix or whenever a batch of samples is prepared in a day, whichever is more frequent; see CLP SOW	≤ 5 x CRQL phthalate esters ≤ CRQL	Investigate source; re-extract and reanalyze associated samples
	Matrix spike	1 per 20 samples of a given matrix or fewer; see CLP SOW	See Table 4.3	Evaluate data for usability
	Matrix spike duplicate	1 per 20 samples of a given matrix or fewer; see CLP SOW	See Table 4.3	Evaluate data for usability
	Laboratory Control Sample	1 per 20 samples or a given matrix or 1 whenever a batch of samples is prepared in a day, whichever is more frequent	See Table 4.3	Evaluate data for usability
	Surrogate spike	All lab and field samples	See Table 4.3	See CLP SOW
	Instrument performance check	Daily or each 12-hour period, whichever is more frequent	CLP SOW	Retune; reanalyze associated samples
	Calibration	CLP SOW	CLP SOW	Recalibrate before sample analyses
	Calibration check	With every calibration	CLP SOW	Recalibrate
	internal standard	Every standard and sample	CLP SOW	See CLP SOW
	Continuing calibration check	Once each 12-hour period	CLP SOW	Identify source and correct. Recalibrate if source not found and corrected
	Retention time window	CLP SOW	± 0.06 relative retention time units (sample and standard)	See CLP SOW

Table 4.3 - Volatile Organic Analysis CLP SOW OLM01.8 Laboratory Surrogate and Matrix Spike Limits

Analytical Method	Spiking Compounds	Spike Concentration		Advisory Limits Percent Recovery		Relative Percent Difference (%)	
		Water (µg/L)	*Soil (µg/kg)*	*Water*	*Soil*	*Water*	*Soil*
	Matrix Spike/LCS						
SVOC, CLP SOW	Phenol	per CLP SOW	per CLP SOW	12-110	26-90	≤42	≤35
	2-Chlorophenol	per CLP SOW	per CLP SOW	27-123	25-102	≤40	≤50
	1,4-Dichlorobenzene	per CLP SOW	per CLP SOW	36-97	28-104	≤28	≤27
	N-nitroso-di-n-propylamine	per CLP SOW	per CLP SOW	41-116	41-126	≤38	≤38
	1,2,4-Trichlorobenzene	per CLP SOW	per CLP SOW	39-98	38-107	≤28	≤23
	4-Chloro-3-methylphenol	per CLP SOW	per CLP SOW	23-97	26-103	≤42	≤33
	Acenaphthene	per CLP SOW	per CLP SOW	46-118	31-137	≤31	≤19
	4-Nitrophenol	per CLP SOW	per CLP SOW	10-80	11-114	≤50	≤50
	2,4-Dinitrotoluene	per CLP SOW	per CLP SOW	24-96	28-89	≤38	≤47
	Pentachlorophenol	per CLP SOW	per CLP SOW	9-103	17-109	≤50	≤47
	Pyrene	per CLP SOW	per CLP SOW	26-127	35-142	≤31	≤36
	Surrogates						
	Nitrobenzene-d5	per CLP SOW	per CLP SOW	35-114	23-120	NA	NA
	2-Fluorobiphenyl	per CLP SOW	per CLP SOW	43-116	30-115	NA	NA
	p-Terphenyl-d14	per CLP SOW	per CLP SOW	33-141	18-137	NA	NA
	Phenol-d5	per CLP SOW	per CLP SOW	10-110	24-113	NA	NA
	2-Fluorophenol	per CLP SOW	per CLP SOW	21-110	25-121	NA	NA
	2,4,6-Tribromophenol	per CLP SOW	per CLP SOW	10-123	19-122	NA	NA
	2-Chlorophenol-d4	per CLP SOW	per CLP SOW	33-110	20-130	NA	NA
	1,2-Dichlorobenzene-d4	per CLP SOW	per CLP SOW	16-110	20-130	NA	NA

5. ANALYTE LIST AND REPORTING LIMITS

These are expected quantitation limits based on reagent grade water or a purified solid matrix. Actual quantitation limits may be higher depending upon the nature of the sample matrix. The limit reported on final laboratory reports will take into account the actual sample volume or weight, percent moisture (where applicable), and the dilution factor, if any.

Table 5.1 - Semi-Volatile Organic Analysis - CLP SOW OLM01.8 Target Analyte List

Analyte	Water (µg/L)	Soil (µg/kg)
Phenol	10	330
bis(2-Chloroethyl)ether	10	330
2-Chlorophenol	10	330
1,3-Dichlorobenzene	10	330
1,4-Dichlorobenzene	10	330
1,2-Dichlorobenzene	10	330
2-Methylphenol	10	330
2,2'-oxybis(1-Chloropropane)[1]	10	330
4-Methylphenol	10	330
N-nitroso-di-n-dipropylamine	10	330
Hexachloroethane	10	330

Table 5.1 - Semi-Volatile Organic Analysis - CLP SOW OLM01.8 Target Analyte List

Analyte	Water (µg/L)	Soil (µg/kg)
Nitrobenzene	10	330
Isophorone	10	330
2-Nitrophenol	10	330
2,4-Dimethylphenol	10	330
bis(2-Chloroethoxy)methane	10	330
2,4-Dichlorophenol	10	330
1,2,4-Trichlorobenzene	10	330
Naphthalene	10	330
4-Chloroaniline	10	330
Hexachlorobutadiene	10	330
4-Chloro-3-methylphenol	10	330
(para-chloro-meta-cresol)	10	330
2-Methylnaphthalene	10	330
Hexachlorocyclopentadiene[2]	NA	330
2,4,6-Trichlorophenol	10	330
2,4,5-Trichlorophenol	25	800
2-Chloronaphthalene	10	330
2-Nitroaniline	25	800
Dimethylphthalate	10	330
Acenaphthylene	10	330
2,6-Dinitrotoluene	10	330
3-Nitroaniline	25	800
Acenaphthene	10	330
2,4-Dinitrophenol	25	800
4-Nitrophenol	25	800
Dibenzofuran	10	330
2,4-Dinitrotoluene	10	330
Diethylphthalate	10	330
4-Chlorophenyl-phenyl ether	10	330
Fluorene	10	330
4-Nitroaniline	25	800
4,6-Dinitro-2-methylphenol	25	800
N-nitrosodiphenylamine	10	300
4-Bromophenyl-phenylether	10	330
Hexachlorobenzene	10	330
Pentachlorophenol	25	800
Phenanthrene	10	330
Anthracene	10	330
Carbazole	10	330
Di-n-butylphthalate	10	330
Fluoranthene	10	330
Pyrene	10	330
Butylbenzylphthalate	10	330
3,3'-Dichlorobenzidine	10	330
Benzo(a)anthracene	10	330
Chrysene	10	330
bis(2-Ethylhexyl)phthalate	10	330
Di-n-octylphthalate	10	330

Table 5.1 - Semi-Volatile Organic Analysis - CLP SOW OLM01.8 Target Analyte List

Analyte	Water (µg/L)	Soil (µg/kg)
Benzo(b)fluoranthene	10	330
Benzo(k)fluoranthene	10	330
Benzo(a)pyrene	10	330
Indeno(1,2,3-cd)pyrene	10	330
Dibenz(a,h)anthracene	10	330
Benzo(g,h,i)perylene	10	330
Additional Compounds		
2-Benzyl-4-chlorophenol	10	330
Benzyl alcohol	10	330
Benzoic acid	50	1600

[1] Previously known by the name bis (2-chloroisopropyl) ether

[2] Spike recoveries in water for hexachlorocyclopentadiene from method validation studies have demonstrated that the compound can't be adequately detected by this method

ATTACHMENT A FOR

METHOD A-003

Attachment A for Method A-003

Modification to CLP Organic SOW OLM01.8
"Statement of Work for Organic Analysis,
Multi-media, Multi-concentration"

The purpose of this addendum is to outline modifications to the Contract Laboratory Program (CLP) "Statement of Work for Organic Analysis, Multi-media, Multi-concentration" which are project specific to the QAPP prepared by Roy F. Weston, Inc. for investigative activities at the Department of Energy/LANL Mound Plant, Miamisburg, Ohio.

This addendum extends the analysis to include 4-chloro-2-(phenylmethyl)phenol, benzoic acid, and benzyl alcohol for semi-volatiles.

Exhibit A - Summary of Requirements

No modifications to this section.

Exhibit B - Reporting and Deliverables Requirements

Section I: Contract Reports/Deliverables Distribution

No modifications to this section.

Section II: Report Descriptions and Order of Data Deliverables

No modifications to this section.

Section III: Form Instructions

No modifications to this section.

Section IV: Data Reporting Forms:

The following compounds must be added on Form I (Data Sheets).

CAS No.	Semi-Volatiles
120-32-1	4-Chloro-2-(phenylmethyl)phenol
100-51-6	Benzyl Alcohol
65-85-0	Benzoic Acid

Form VI SV-2 (Initial Calibration) and Form VII SV-2 (Continuing Calibration) must be modified to include these additional compounds: 4-Chloro-2-(phenylmethyl)phenol, benzyl alcohol, and benzoic acid.

Exhibit C - Target Compound List (TCL) and Contract Required Quantitation Limits(CRQL)

The following should be added to the Target Compound List (TCL) and Contract required Quantitation Limits(CRQL, Page C-2 and Page C-4):

Analyte	CAS No.	CRQL			On Col. (ng)
		Low Water ug/L	Low Soil ug/kg	Med. Soil ug/kg	
4-Chloro-2-(phenylmethyl)phenol	120-32-1	10	330	10000	20
Benzyl Alcohol	100-51-6	10	330	10000	20
Benzoic Acid	65-85-0	50	1600	50000	100

Exhibit D - Analytical Methods for Semi-Volatiles (SV)

Section I: Introduction

No modifications to this section.

Section II: Sample Preparation and Storage

No modifications to this section.

Section III: Screening of SV organic Extracts

No modifications to this section.

Section IV: GC/MS Analysis of SV

1. Summary of Method: No modifications to this section.

2. Apparatus and Materials: No modifications to this section.

3. Reagents:

3.1 Internal standards - No modifications to this section.

3.2 Calibration standards - 4-Chloro-2-(phenylmethyl)phenol and benzyl alcohol must be added to the calibration standards prepared at 20, 50, 80, 120 and 160 total ng per 2 µL. Benzoic acid must be added to the calibration standard prepared at 50, 80, 120, 160 total ng per 2 µL.

3.3 DFTPP solution - No modifications to this section.

4. Instrument operating Conditions: No modifications to this section.

5. Calibration:

5.1 No modifications to this section.

5.2 and Table 2 Add: 4-Chloro-2-(phenylmethyl)phenol, benzoic acid, and benzyl alcohol must be calibrated using the closest eluting internal standard.

5.3 - 5.5 No modifications to this section.

Table 4 Add:

Parameter	Primary Ion	Secondary Ion (s)
4-Chloro-2-(phenylmethyl) phenol	218	183,165,140
Benzyl Alcohol	108	79,77
Benzoic Acid	122	105,77

5.6.1 No modifications to this section.

5.6.2 Add: 4-Chloro-2-(phenylmethyl)phenol, benzoic acid, and benzyl alcohol to the list of compounds. The maximum %RSD must be ± 25 and maximum % Difference ± 30. However, this compound must meet the minimum RRF criteria of 0.01.

These are advisory limits and final limits will be established after method validation.

5.7 - 5.13 No modifications to this section.

6. Sample Analysis: No modifications to this section.

7. Qualitative Analysis: No modifications to this section.

8. Quantitation: No modifications to this section.

9. GC/MS Confirmation of Pesticides and Aroclors: No modifications to this section.

Exhibit E - QA/QC Requirements

I. Overview:

No modifications to this section.

II. Quality Assurance Plan:

No modifications to this section.

III. Standard Operating Procedure:

No modifications to this section.

IV. QA/QC Requirements: Semi-volatile QA/QC requirements

1. GC/MS Mass Calibration and Ion Abundance Patterns:

   No modifications to this section.

2. GC/MS Initial Calibration:
   Reference to Exhibit D includes the modifications to Exhibit D presented in this addendum.

3. Continuing Calibration:

   Reference to Exhibit D includes the modifications to Exhibit D presented in this addendum.

4. Internal Standards Responses and Retention Times:

   No modifications to this section.

5. Method Blank Analysis:

   No modifications to this section.

6. System Monitoring Compound Recoveries:

   No modifications to this section.

7. Matrix Spike and Matrix Spike Duplicate Analysis:

   Reference to Exhibit D includes the modifications to Exhibit D presented in this addendum.

8. Dilution of Samples, MS and MSD

   No modifications to this section.

VII Regional Data Review

No modifications to this section.

VIII Laboratory Evaluation Samples

No modifications to this section.

IX GC/MS Tape Audits

No modifications to this section.

X Data Package Audits

No modifications to this section.

XI On Site Laboratory Evaluations

No modifications to this section.

XII Quality Assurance and Data Management

No modifications to this section.

XIII Data Management

No modifications to this section.

Exhibit F - Chain-of-Custody, Document Control, and Standard Operating Procedures

No modifications to this section.

Exhibit G - Glossary of Terms

No modifications to this section.

Exhibit H - Data Dictionary and Format for Data Deliverables in Computer-Readable Format

No modifications to this section.

ATTACHMENT B FOR METHOD A-003

Attachment B for Method A-003

Statement of Work for Soil Preparation for Common Organic, Inorganic, and Selected Radiological Analyses

1.0 Scope and Application

This procedure describes how to aliquot Mound soil and soil-like samples for laboratory preparation and analysis. This procedure applies to soil analysis for metals, semi-volatiles, pesticide/PCBs, cyanide, anions, explosives, and radiological analyses which do not have a prescribed soil preparation procedure. This procedure should not be used for volatile organic analysis. Soils for volatile organic analysis will be prepared and homogenized as described in the method of analysis.

2.0 Summary

A representative aliquot of a sample is taken in the laboratory by either visually examining and taking a representative portion from each layer in a sample, or taking a core of the sample.

3.0 Interferences

Soil samples are heterogeneous by nature. Because of this nature, target analytes are often channeled and concentrated in the soil in specific layers or locations. This heterogeneity may affect both how representative the sample is of the field location and how representative the laboratory aliquot is of the sample.

The heterogeneous nature of soils can sometimes be eliminated in laboratory aliquoting by visually inspecting the sample for layering and selecting a representative aliquot or by taking a core of the sample.

4.0 Equipment

4.1 Spatula or Scoop

4.2 Glass tray, plastic tray, or other material for containing spilled soil

4.3 Large container, i.e. 1000 mL Pyrex beaker

5.0 Reagents/Supplies

5.1 Disposable gloves

6.0 Sample Collection/Holding Time/Preservation

6.1 See Section 2.0 of Method A-003.

7.0 Procedure

7.1 Place a glass tray, plastic tray, or disposable paper beneath the sample container. The tray or paper will be used to contain any soil which accidentally falls off the bottle lip when the cap is opened or falls out while the sample is taken.

7.2 Visually examine the contents of the sample container. If obvious layering is present, then representative portions of each layer must be taken for the aliquot.

If the sample is obviously a core sample (cylindrical soil mass), then use the spatula to core from the top of the sample to the bottom of the sample. This procedure should be representative of the entire core.

If the sample cannot be easily cored, it may be necessary to transfer the sample to a large container and thoroughly and carefully mix the sample with a spatula or scoop. Mixing will not be performed on soil samples for volatile and semi-volatile analyses.

If the sample is neither layered nor a core sample, then use a spatula to core through the middle of the sample. The core should be representative of the entire sample.

7.3 Process the sample as specified in the applicable method.

8.0 Quality Control

8.1 Each analytical method has specific types of quality control samples introduced to evaluate laboratory precision and reproducibility of sample results. Typically, these quality control samples are laboratory duplicates or matrix spike duplicates. These quality control samples permit the laboratory to calculate the relative percent difference and evaluate the soil aliquoting procedure and the precision of the method.

9.0 References and Associated Standard Operating Procedures

None

MOUND

Environmental
Restoration
Program

Method: A-023

Total Petroleum Hydrocarbon, Method 418.1

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: Compendium (November 1996)

1. INTRODUCTION

1.1 Description

Total Petroleum Hydrocarbon (TPH) analysis by infrared spectrometry is performed to determine the quantity of heavy hydrocarbons (used oil, heavy fuel oils, lubricating oils, etc.) in a sample. TPH analysis by method E418.1 is required by the State of Ohio Fire Marshal through the Bureau of Underground Storage Tank Regulations (BUSTR).

Water samples collected for TPH analysis will be acidified to a pH less than 2 in the field and then analyzed in accordance with EPA method E418.1. Soil samples will be prepared following a combination of SW9071 and E418.1. Method SW9071 is used to extract the oils from the soil into a Freon. The Freon is treated with silica gel and analyzed in accordance with method E418.1.

1.2 References

EPA. 1986. "Test Methods for Evaluating Solid Waste." Laboratory Manual/Physical Methods, SW-846, Volumes 1A, 1B and 1C, third edition. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. November 1986.

EPA. 1987. "Test Methods for Evaluating Solid Waste." Laboratory Manual/Physical Methods, SW-846, Volumes 1A, 1B and 1C, third edition. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. December 1987.

EPA. 1990. "Test Methods for Evaluating Solid Waste." Laboratory Manual/Physical Methods, SW-846, Volumes 1A, 1B and 1C, third edition. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. March 1990.

EPA. 1993. "Methods for Chemical Analysis of Water and Waste," U.S. Environmental Protection Agency, EPA-600/4-79-020 revised March 1983.

DOE. 1994. "Fire Fighting Training Area Removal Action Operable Unit 5 Work Plan," U.S. Department of Energy, Mound Plant, June 1994.

2. PRESERVATION

Table 2.1 - Total Petroleum Hydrocarbon Analysis, Method 418.1 Sample Containers, Volumes, Preservation, and Holding Times

Matrix	Parameters	Analytical Method	Container	Minimum Volume	Preservation	Holding Time
Water	TPH	E418.1	Amber glass bottle with a Teflon-lined lid.	2 - 1 liter	pH<2 with HCl Cool 4°C	7 days
Soil	TPH	SW9071/E418.1	Glass bottle with Teflon-lined lid (no headspace)	120g bottle	Cool 4°C	28 days

3. CALIBRATION

At least a five point calibration curve with a correlation coefficient greater than or equal to 0.996 will be generated. The curve will include a standard at or near the reporting limit and a high standard which does not exceed the linear range of the instrument. The calibration curve will be verified daily and after every 20 samples using a mid-level standard. If the verification fails, a new calibration curve will be generated, and the previous 20 affected samples re-analyzed.

4. QC CRITERIA

Table 4.1 - Total Petroleum Hydrocarbon Field QC Sample Frequency

Parameters	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Total Petroleum Hydrocarbon, E418.1	Field Duplicate	1 per 10 or fewer field samples.	≤ 35 percent RPD	Evaluate data usability
	Equipment Blank (rinsate)	1 per 10 or fewer field samples	< CRQL	Evaluate data usability

Table 4.2 - Total Petroleum Hydrocarbon - E418.1 Laboratory QC Sample Frequency

Parameter	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Total Petroleum Hydrocarbons, E418.1	Method Blank	1 per 20 or 1 per batch whichever is more frequent	< CRQL	Investigate source; re-analyze associated samples
	Matrix Spike	1 per 20 samples of a given matrix	See Table 4.3	Evaluate data usability
	Matrix Spike Duplicate	1 per 20 samples of a given matrix	See Table 4.3	Evaluate data usability
	Laboratory Control Sample	1 per 20 samples or 1 per batch whichever is more frequent	80 - 120 percent recovery	Investigate source; re-analyze associated samples
	Calibration	Five point calibration	$r^2 > 0.9996$	Re-calibrate
	Continuing Calibration check	1 per 20 samples	80 -120 percent recovery	Re-calibrate

Table 4.3 - Total Petroleum Hydrocarbon - E418.1 Laboratory Matrix Spike Limits

Analytical Method	Spiking Compounds	Spike Concentration		Advisory Limits Percent Recovery		Advisory Limits Relative Percent Difference (%)	
		Water (mg/L)	*Soil (mg/kg)*	*Water*	*Soil*	*Water*	*Soil*
Total Petroleum Hydrocarbon, E418.1	Reference Oil Mixture	4.2	4.2	75 - 125	75 - 125	≤ 15	≤ 15

5. ANALYTE LIST AND REPORTING LIMITS

These are expected quantitation limits based on reagent grade water or a purified solid matrix. Actual quantitation limits may be higher depending upon the nature of the sample matrix. The limit reported on final laboratory reports will take into account the actual sample volume or weight, percent moisture (where applicable), and the dilution factor, if any.

Table 5.1 - Total Petroleum Hydrocarbon - Method 418.1 Target Analyte List

Analyte	Water (mg/L)	Soil (mg/kg)
Total Petroleum Hydrocarbon	1.0	1.0

MOUND

Environmental
Restoration
Program

Method: Q-004

Laboratory Data Reduction

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: QAPP (April 1995)

1. INTRODUCTION

This procedure describes the laboratory data reduction requirements.

2. RESPONSIBILITIES

Not applicable.

3. PROCEDURES

The computation of analytical results from the raw data generated in the laboratory is performed as prescribed in various analytical methods. The step-by-step calculations are provided in the referenced analytical method. ***Soil/sediment sample results will be corrected for moisture content and reported on a dry weight basis.*** Sample results will not be corrected for blank results. Manually calculated results and data interpretations shall be reviewed by an independent laboratory analyst.

The data report packages must be reviewed for completeness by an individual other than the person who compiles the package. The completeness requirements are specified in method Q-005 or Q-014. After verifying the completeness of the data package, the data package will be duplicated. One copy of the data package will be delivered to the Mound plant and the original will be retained by the laboratory. The laboratory must retain their copy of the data package for at least 10 years. At such time as the data are to be disposed of, the laboratory must notify the Mound Plant Contractor, the Department of Energy's Ohio Field Office, and the United States Environmental Protection Agency Region V.

MOUND

Environmental
Restoration
Program

Method: Q-005

Laboratory Data Reporting - Tier III - Complete Data Package Summary

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: QAPP (April 1995)

1. INTRODUCTION

1.1 Description

The procedures described herein are reporting requirements designed to provide data packages suitable for data validation and litigation. These procedures describe the laboratory hardcopy reporting requirements, including data package content, data package organization, and approved data qualifiers.

In addition to the hardcopy data specifications, laboratories are also required to submit an electronic deliverable per the specifications in Compendium Methods Q-010, Q-011, Q-012, and/or Q-013.

2. RESPONSIBILITIES

Not applicable

3. PROCEDURES

3.1 Chemical and Radiological Data Reporting

Laboratory data will be provided on electronic media and in hardcopy data reports. All data report packages (i.e., hardcopy results and supporting data) received from the laboratory will be single-sided, legible, paginated, reproducible, and unbound. Electronic Data Deliverables must be shipped with each complete data package. **Only data report packages containing all results for a given field batch will be shipped.** Laboratory batches cannot be greater in size than the identified field batch.

3.1.1 General Requirements

Laboratory data reports will contain sufficient data to verify each aspect of the analysis, including sample preparation, instrument calibration, sample analysis, and calculation of the final results. All laboratory data report packages for each type of analysis will contain a case narrative that summarizes the following information on the given set of samples analyzed:

- date of issue;
- the laboratory analysis performed;
- any deviations from the stated analytical method;
- the laboratory batch number;
- the laboratory SOP number and revision date;
- example calculation;
- the number of samples and the sample matrices;
- a reference to the quality control procedures performed for the specific methods used, including the reference to the acceptance criteria used;
- the contents of the laboratory report;

- the project name and number;
- the state of the sample received (e.g., whether preserved and packaged properly);
- whether sample holding times were met and identification of those samples for which they were not met;
- any observations that may have had an impact on the analyses;
- any technical problems affecting the analysis and corrective actions taken;
- laboratory quality control checks that did not meet the project criteria (as specified in the QAPP) and/or laboratory criteria (include any corrective actions taken and any known possible reasons for the results); and
- the laboratory manager's signature approving the issuance of the data package.

A copy of the chain-of-custody form with all relinquished signatures will accompany each data package.

The following summarizes the contents of hardcopy laboratory data report packages for each group of analyses. The laboratory-established quantitation limits, other than CLP analysis, will be reported in the packages.

3.1.2 Data Packages

For those analyses performed under the CLP SOW for inorganic and organic compounds, data report packages will follow the requirements set forth in the CLP SOW. These include volatile organic and semivolatile organic compounds, TCL pesticides and PCBs, and inorganics for water and soil samples. The CLP forms will include the additional parameters outside the TCL and TAL lists. In addition, the following information will be included:

- instrument settings;
- established retention time windows;
- detailed table of contents;
- for initial and continuing calibrations, a summary of standards analyzed, date, time of analysis, instrument ID, mean/average calibration factor or response factor, the standard deviation and the percent difference; instrument run log containing the analytical sequence with date and time.

CLP data report packages will be formatted as specified in the CLP SOW. Sections and subsections will be numbered and will be separated by a colored divider sheet.

3.1.3 Format of Data Reports

The non-CLP data report package will be organized by the laboratory into the following sections and paginated. Each section and subsection will be separated by a colored divider sheet.

Section I
Title and Table of Contents
Certificate of Analysis
Case Narrative
Summary of Quality Control
Summary of Sample Results
Summary of Analysis and Preparation Dates
Cross Reference of Sample IDs to Laboratory IDs
Example Calculation

Section II
Analytical Results
Raw Data (behind each result)

Section III
Standards Data
Initial and Continuing Calibration
Retention Time Windows
Instrument Calibration/Tuning
Raw Data (behind each result)

Section IV
Quality Control Results
Raw Data (behind each result)
Sample Preparation/Extraction/Digestion Logs
Moisture Determination Results and Raw Data

Section V
Instrument Run Log
Chain-of-Custody
Copy of Telephone Logs

Specifications to the listed contents of all data packages include the following:

- Tabulated results will also include sample ID with corresponding laboratory ID, the analyte of interest with units and actual limit of quantitation, date of sampling, date of sample preparation/extraction/digestion, date of analysis, sample weight/volume, moisture content (where applicable), dilution factor, sample matrix, and instrument ID (including chromatographic column serial number, dimension, and packing/coating, where applicable.)

- All laboratory QC results which are required to be reported will be tabulated similar to CLP results and contain the same information as the tabulated sample results, where applicable.

- Initial calibration results will include a summary of the standards analyzed, date and time analysis, instrument ID, the mean/average calibration or response factor, standard deviation and acceptance criteria, and raw data (e.g., chromatogram, strip chart, etc.).

- Continuing calibration will include a summary of the standards analyzed, date and time of analysis, instrument ID, a comparison of the standards to the initial calibration, and a calculation of the percent difference from the initial calibration.

- Raw data in the form of instrument printouts, strip charts recordings, chromatograms, etc., will be labeled with the applicable sample ID, date, time of analysis, and instrument conditions.

- An example calculation of one of the sample results illustrating how the actual sample result was obtained will be supplied with each data package. All factors of the equations provided must be accounted for.

3.1.3.1 Explosives Data Packages

Laboratory data packages for explosives analysis will, at a minimum, consist of the following:

- detailed table of contents;
- a case narrative for each laboratory batch of samples analyzed;
- a summary page stating the extraction and analysis dates for each field sample and reported laboratory quality control checks;
- a cross reference of laboratory sample identification numbers to the project sample identification numbers;
- a description of all data qualifiers used in the laboratory report;
- a record of sample extraction of all samples and laboratory quality control checks;
- instrument settings;
- applicable instrument run logs containing the analytical sequence with date and time;
- tabulated sample results for the 11 explosives;
- established retention time windows;
- tabulated results of matrix spikes, matrix spike duplicates, method blank, initial calibration, and continuing calibration checks;
- labeled and dated chromatograms of sample results, matrix spikes, MSDs, the method blank, and continuing calibration checks.

3.1.3.2 Wet Chemistry Data Packages

Reports covering analysis of common anions (chloride, sulfate, fluoride, nitrate, ammonia, and nitrate-nitrite), total nitrogen, total phosphorus, TOC, total dissolved solids, total suspended solids, alkalinity, and physical soil parameters will contain, at a minimum, the following where applicable:

- detailed table of contents;
- a case narrative for each laboratory batch of samples analyzed;
- a summary page stating the analysis dates for field samples and reported laboratory quality control checks;
- a cross reference of laboratory sample identification numbers to the project sample identification numbers;
- a description of all data qualifiers used in the laboratory report;
- a record of sample preparation for all field samples and laboratory quality control samples;
- instrument settings;
- applicable instrument run logs containing the analytical sequence with date and time;
- tabulated sample results;
- raw data for each sample result and laboratory quality control sample results;
- results of initial calibration and calibration checks (including date);
- tabulated results of matrix spikes, MSDs, laboratory replicates, laboratory control samples, and the method blank.

3.1.3.3 Radiochemical Data Packages

Data packages for radiochemical analyses will consist of the following elements:

- detailed table of contents;
- a case narrative for each laboratory batch of samples analyzed;
- a cross reference of laboratory sample identification numbers to the project sample identification numbers;
- a summary page stating the extraction and analysis dates for each field sample and reported laboratory quality control checks;
- a description of all data qualifiers used in the laboratory report;
- a record of sample preparation for all field samples and laboratory quality control;
- instrument calibration results (date, time, technician);

- minimum detectable activity for each sample result and QC result;
- results for standards, including instrument blanks and calibration standards;
- labeled and dated raw data for all sample results and laboratory quality control checks, including counting time and number of disintegrations per sample;
- calculated activity, per unit mass or liquid volume, with the following associated statistics:
  a) relative counting error at the 95% confidence level,
  b) lower detection limit, and
  c) normalized deviation for method spikes and matrix spikes.

3.1.3.4 EPA 8021, 8030, and 502.2 Data Packages

Data report packages for volatile organic compounds for groundwater samples (Methods 8021, 8030, and 502.2) will consist, at a minimum, of the following items where applicable:

- detailed table of contents;
- a case narrative for each laboratory batch of samples analyzed;
- a cross reference of laboratory sample identification to the project sample identification numbers;
- a description of data qualifiers used in the laboratory report;
- a summary page stating the extraction and analysis dates for each field sample and reported laboratory quality control check;
- instrument settings;
- applicable instrument run logs containing the analytical sequence with date and time;
- tabulated sample results for all respective target compounds;
- tabulated results of matrix spikes, matrix spike duplicates, method blank, initial calibration, continuing calibration checks, replicate samples, laboratory control sample, calibration check compounds, and system performance check compounds;
- established retention time windows;
- labeled and dated chromatograms of sample results and the laboratory quality control checks listed above;
- results of the first 10/20 tentatively identified compounds as specified in the CLP SOW for organic analyses (for GC/MS confirmations). Data packages for GC/MS confirmation per CLP SOW requirements.

3.2 Laboratory Data Qualifiers

3.2.1 CLP Organic Laboratory Data Qualifiers

The following qualifiers will be applied to the organic analysis results by the laboratory, in accordance with CLP SOW directions.

- U -	Indicates compound was analyzed for, but not detected. The associated sample quantitation limit will be CRQL, corrected for dilution and for percent moisture.
- J -	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) assuming a 1:1 response, 2) when the qualitative data indicated the presence of a compound that meets the volatile, semi-volatile, and pesticide/Aroclor identification criteria, and the result is less than the CRQL but greater than zero.
- N -	Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds, where identification is based on a mass spectral library search.
- P -	Used for pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns.
- C -	Applies to pesticide results where the identification has been confirmed by GC/MS.
- B -	Used when the analyte is found in the associated blank as well as in the sample. This flag must be used for a TIC as well as for a positively identified target compound.
- E -	Identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D -	Identifies all compounds identified in an analysis at a secondary dilution factor.
- A -	Indicates that a TIC is a suspected aldol-condensation product.

3.2.2 CLP Inorganic Laboratory Data Qualifiers

The following qualifiers will be applied to the inorganic analysis results by the laboratory, in accordance with CLP SOW directions:

- B -	Indicates that the reported value was obtained from a reading that was less than the CRDL but greater than or equal to the Instrument Detection Limit (IDL).

- U -	Indicates that the analyte was analyzed for, but not detected.
- E -	Indicates that the reported value is estimated because of the presence of interferences.
- M -	Duplicate injection precision was not met.
- N -	Spiked sample recovery not within control limits.
- S -	Reported value was determined by the Method of Standard Additions (MSA).
- W -	Post-digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * -	Duplicate analysis not within control limits.
- + -	Correlation coefficient for the MAS is less than 0.995.

Method qualifiers for inorganic procedures are detailed in the CLP SOW.

3.2.3 Non-CLP Qualifiers

The following qualifier will be applied for Non-CLP results by the laboratory:

- U -	Indicates the analyte was analyzed for, but not detected.

3.2.4 Other Qualifiers

Approval by the EG&G subcontractor is required for any additional data qualifiers used by the laboratory, other than those defined above, prior to submitting hardcopy data packages.

3.3 Other Laboratory Data

Laboratory reports for geotechnical analyses and X-ray diffraction results will meet, at a minimum, the requirements for reporting in the standard method.

3.4 Data Package Completeness Checklist

In Attachment A of this procedure, analysis-specific data package completeness checklists have been included. The checklists should be completed and accompany each package, as appropriate, based on the requested analysis.

Attachment A

Data Package Completeness Checklist
EG&G Mound Project

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

METALS/CYANIDE

- ☐ TABLE OF CONTENTS (Checklist)
- ☐ I. CASE NARRATIVE
  - ☐ COVER PAGE
  - ☐ CASE NARRATIVE
  - ☐ CROSS REFERENCE OF SAMPLE I.D TO LABORATORY I.D.
  - ☐ DESCRIPTION OF ALL QUALIFIERS USED BY THE LABORATORY
  - ☐ APPLICABLE LABORATORY SOP AND REVISION DATE
- ☐ IIA.SAMPLE DATA
  - ☐ RESULTS FORM I - IN
- ☐ IIB.QUALITY CONTROL DATA
  - ☐ INITIAL AND CONTINUING CALIBRATION VERIFICATION [FORM II (PART I) - IN]
  - ☐ CRDL STANDARD FOR AA AND ICP [FORM II (PART 2) - IN]
  - ☐ BLANKS [FORM III - IN]
  - ☐ ICP INTERFERENCE CHECK SAMPLE [FORM IV - IN]
  - ☐ SPIKE SAMPLE RECOVERY [FORM VA (PART 1) - IN]
  - ☐ POST DIGEST SPIKE SAMPLE RECOVERY [FORM VB (PART 2) - IN]
  - ☐ DUPLICATES [FORM VI - IN]
  - ☐ LABORATORY CONTROL SAMPLE [FORM VII - IN]
  - ☐ STANDARD ADDITION RESULTS [FORM VIII - IN]
  - ☐ ICP SERIAL DILUTIONS [FORM IX - IN]
  - ☐ INSTRUMENT DETECTION LIMITS (QUARTERLY) [FORM X - IN]
  - ☐ ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY) [FORM XI (PART 1) - IN]
  - ☐ ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY) [FORM XI (PART 2) - IN]
  - ☐ ICP LINEAR RANGES (QUARTERLY) [FORM XII - IN]
  - ☐ PREPARATION LOG [FORM XIII - IN]
  - ☐ ANALYSIS RUN LOG [FORM XIV - IN]
- ☐ IIC.RAW DATA
  - ☐ EXAMPLE CALCULATION
  - ☐ INSTRUMENT SETTINGS
  - ☐ ICP RAW DATA
  - ☐ FURNACE AA RAW DATA
  - ☐ MERCURY RAW DATA
  - ☐ CYANIDE RAW DATA
  - ☐ PREPARATION AND DISTILLATION LOGS RAW DATA
    - ☐ PERCENT SOLIDS DETERMINATION LOGS

DATA PACKAGE COMPLETENESS CHECKLIST (CONT.)
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

METALS/CYANIDE

☐ IID. STANDARDS

- ☐ PREPARATION RECORDS
- ☐ ANALYSIS RECORDS AA AND ICP LOGS

☐ IIE. SAMPLE RECEIPT

- ☐ TRAFFIC REPORTS
- ☐ SAMPLE LOG IN RECORD

☐ IIF. NONCONFORMANCE RECORDS / CORRESPONDENCE / TELEPHONE COMMUNICATIONS RECORDS / ETC.[1]

Laboratory Reviewer: _____ Date: _____

WESTON Verified By: _____ Date: _____

Comments: _____

[1] Any records not specified, but pertaining to the sample analysis

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

VOLATILES ORGANIC COMPOUNDS (VOCs)

☐ TABLE OF CONTENTS (CHECK LIST)

☐ IIIA. CASE NARRATIVE

- ☐ COVER PAGE
- ☐ CASE NARRATIVE
- ☐ CROSS REFERENCE OF SAMPLE ID TO LABORATORY ID
- ☐ DESCRIPTION OF ALL QUALIFIERS USED BY THE LABORATORY APPLICABLE LABORATORY SOP AND REVISION DATE

☐ QC SUMMARY

- ☐ SYSTEM MONITORING COMPOUND SUMMARY (FORM II VOA)
- ☐ MATRIX SPIKE/MATRIX SPIKE DUPLICATE SUMMARY (FORM III VOA)
- ☐ METHOD BLANK SUMMARY (FORM IV VOA)
- ☐ GC/MS INSTRUMENT PERFORMANCE CHECK (FORM V VOA)
- ☐ INTERNAL STANDARD AREA AND RT SUMMARY (FORM VIII VOA)
- ☐ LABORATORY CONTROL SAMPLE

☐ IIIB. SAMPLE DATA

- ☐ EXAMPLE CALCULATION
- ☐ TARGET COMPOUND RESULTS - ORGANIC ANALYSIS DATA SHEET (FORM I VOA)
- ☐ TENTATIVELY IDENTIFIED COMPOUNDS (FORM I VOA - TIC)
- ☐ RECONSTRUCTED TOTAL ION CHROMATOGRAMS (RIC)
- ☐ QUANTITATION REPORT
- ☐ RAW SPECTRA AND BACKGROUND - SUBTRACTED MASS SPECTRA OF TARGET COMPOUNDS IDENTIFIED
- ☐ GC/MS LIBRARY SEARCH SPECTRA FOR TIC (3 BEST LIBRARY MATCHES)
- ☐ QUANTITATION / CALCULATION OF TIC CONCENTRATIONS

☐ IIIC. STANDARD(S) DATA

- ☐ INITIAL CALIBRATION DATA (FORM VI VOA)
- ☐ VOA STANDARD(S) RECONSTRUCTED ION CHROMATOGRAMS AND QUANTITATION REPORTS
- ☐ CONTINUING CALIBRATION (FORM VII VOA)
- ☐ VOA STANDARD(S) RECONSTRUCTED ION CHROMATOGRAMS AND QUANTITATION REPORTS

DATA PACKAGE COMPLETENESS CHECKLIST (CONT.)
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

VOLATILES ORGANIC COMPOUNDS (VOCs)

☐ IIID. RAW QC DATA

- ☐ BFB / BAR GRAPH SPECTRUM / MASS LISTING
- ☐ BLANK DATA
  - ☐ RECONSTRUCTED TOTAL ION CHROMATOGRAM AND QUANTITATION REPORTS
  - ☐ TARGET COMPOUND SPECTRA
  - ☐ GC/MS LIBRARY SEARCH SPECTRA FOR TIC
  - ☐ QUANTITATION / CALCULATION OF TIC CONCENTRATIONS
- ☐ MATRIX SPIKE DATA
  - ☐ TABULATED RESULTS (FORM I VOA)
  - ☐ RECONSTRUCTED ION CHROMATOGRAM(S)
- ☐ MATRIX SPIKE DUPLICATE DATA
  - ☐ TABULATED RESULTS (FORM I VOA)
  - ☐ RECONSTRUCTED ION CHROMATOGRAM(S)
- ☐ INSTRUMENT SETTINGS
- ☐ INSTRUMENT RUN LOGS
- ☐ PERCENT SOLIDS DETERMINATION LOGS

☐ IIIE. SAMPLE RECEIPT

- ☐ TRAFFIC REPORTS
- ☐ SAMPLE LOG IN RECORD

☐ IIIF. NONCONFORMANCE RECORDS / CORRESPONDENCE / TELEPHONE COMMUNICATIONS RECORDS / ETC.[1]

Laboratory Reviewer: _____ Date: _____

WESTON Verified By: _____ Date: _____

Comments: _____

[1] Any records not specified, but pertaining to the sample analysis

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S):

SEMIVOLATILES ORGANIC COMPOUNDS

- ☐ TABLE OF CONTENTS (CHECK LIST)
- ☐ IVA. CASE NARRATIVE
  - ☐ COVER PAGE
  - ☐ CASE NARRATIVE
  - ☐ CROSS REFERENCE OF SAMPLE ID TO LABORATORY ID
  - ☐ DESCRIPTION OF ALL QUALIFIERS USED BY THE LABORATORY
  - ☐ APPLICABLE LABORATORY SOP AND REVISION DATE
- ☐ QC SUMMARY
  - ☐ SURROGATE PERCENT RECOVERY SUMMARY (FORM II SV)
  - ☐ MATRIX SPIKE/MATRIX SPIKE DUPLICATE SUMMARY (FORM III SV)
  - ☐ METHOD BLANK SUMMARY (FORM IV SV)
  - ☐ GC/MS INSTRUMENT PERFORMANCE CHECK (FORM V SV)
  - ☐ INTERNAL STANDARD AREA AND RT SUMMARY (FORM VIII SV)
  - ☐ LABORATORY CONTROL SAMPLE
- ☐ IVB. SAMPLE DATA
  - ☐ EXAMPLE CALCULATION
  - ☐ TARGET COMPOUND RESULTS - ORGANIC ANALYSIS DATA SHEET (FORM I SV)
  - ☐ TENTATIVELY IDENTIFIED COMPOUNDS (FORM I SV - TIC)
  - ☐ RECONSTRUCTED TOTAL ION CHROMATOGRAMS (RIC)
  - ☐ QUANTITATION REPORT
  - ☐ RAW SPECTRA AND BACKGROUND - SUBTRACTED MASS SPECTRA OF TARGET COMPOUNDS IDENTIFIED
  - ☐ GC/MS LIBRARY SEARCH SPECTRA FOR TIC (3 BEST LIBRARY MATCHES)
  - ☐ QUANTITATION / CALCULATION OF TIC CONCENTRATIONS
- ☐ IVC. STANDARD(S) DATA
  - ☐ INITIAL CALIBRATION DATA (FORM VI SV-1, SV-2)
  - ☐ SV STANDARD(S) RECONSTRUCTED ION CHROMATOGRAMS AND QUANTITATION REPORTS
  - ☐ CONTINUING CALIBRATION (FORM VII SV-1, SV-2)
  - ☐ SV STANDARD(S) RECONSTRUCTED ION CHROMATOGRAMS AND QUANTITATION REPORTS
  - ☐ SEMIVOLATILE GPC CALIBRATION DATA
- ☐ IVD. RAW QC DATA
  - ☐ DFTPP
    - ☐ RECONSTRUCTED TOTAL ION CHROMATOGRAM (RIC)
    - ☐ BAR GRAPH SPECTRUM
    - ☐ MASS LISTING

DATA PACKAGE COMPLETENESS CHECKLIST (CONT.)
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S):

SEMIVOLATILES ORGANIC COMPOUNDS

- ☐ BLANK DATA
  - ☐ TABULATED RESULTS (FORM I SV-1, SV-2)
  - ☐ TIC'S (FORM I SV-TIC)
  - ☐ RECONSTRUCTED ION CHROMATOGRAM
  - ☐ TARGET COMPOUND SPECTRA
  - ☐ GC / MS LIBRARY SEARCH SPECTRA FOR TIC
  - ☐ QUANTITATION / CALCULATION OF TIC CONCENTRATIONS
- ☐ MATRIX SPIKE DATA
  - ☐ TABULATED RESULTS (FORM I)
  - ☐ RECONSTRUCTED ION CHROMATOGRAM(S)
- ☐ MATRIX SPIKE DUPLICATE DATA
  - ☐ TABULATED RESULTS (FORM I SV-1, SC-2)
  - ☐ RECONSTRUCTED ION CHROMATOGRAM(S)
- ☐ INSTRUMENT SETTINGS
- ☐ INSTRUMENT RUN LOGS
- ☐ SAMPLE EXTRACTION/PREPARATION LOGS
- ☐ PERCENT SOLIDS DETERMINATION LOGS

☐ IVE. SAMPLE RECEIPT

- ☐ TRAFFIC REPORTS
- ☐ SAMPLE LOG IN RECORD

☐ IVF. NONCONFORMANCE RECORDS / CORRESPONDENCE / TELEPHONE COMMUNICATIONS RECORDS / ETC. [1]

Laboratory Reviewer: _____ Date: _____

WESTON Verified By: _____ Date: _____

Comments: _____

[1] Any records not specified, but pertaining to the sample analysis

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S):

PESTICIDES AND PCBs

☐ TABLE OF CONTENTS (CHECK LIST)

☐ VA. CASE NARRATIVE

- ☐ COVER PAGE
- ☐ CASE NARRATIVE
- ☐ CROSS REFERENCE OF SAMPLE ID TO LABORATORY ID
- ☐ DESCRIPTION OF ALL QUALIFIERS USED BY THE LABORATORY
- ☐ APPLICABLE LABORATORY SOP AND REVISION DATE

☐ QC SUMMARY

- ☐ SURROGATE PERCENT RECOVERY SUMMARY (FORM II PEST)
- ☐ MATRIX SPIKE/MATRIX SPIKE DUPLICATE SUMMARY (FORM III PEST)
- ☐ METHOD BLANK SUMMARY (FORM IV PEST)
- ☐ LABORATORY CONTROL SPIKE

☐ VB. SAMPLE DATA

- ☐ EXAMPLE CALCULATION
- ☐ TARGET COMPOUND RESULTS - ORGANIC ANALYSIS DATA SHEET (FORM I PEST)
- ☐ PESTICIDE CHROMATOGRAMS
- ☐ GC INTEGRATION REPORT
- ☐ PESTICIDE CHROMATOGRAMS SECOND GC COLUMN
- ☐ GC INTEGRATION REPORT
- ☐ MANUAL WORK SHEETS

☐ VC. STANDARD(S) DATA

- ☐ INITIAL CALIBRATION OF SINGLE COMPONENT ANALYTES (FORM VI PEST-1, PEST-2)
- ☐ INITIAL CALIBRATION OF MULTICOMPONENT ANALYTES (FORM VI PEST-3)
- ☐ ANALYTE RESOLUTION SUMMARY (FORM VI PEST-4)
- ☐ CALIBRATION VERIFICATION SUMMARY (FORM VII PEST-1)
- ☐ CALIBRATION VERIFICATION SUMMARY (FORM VII PEST-2)
- ☐ ANALYTICAL SEQUENCE (FORM VIII PEST)
- ☐ FLORISIL CARTRIDGE CHECK (FORM IX PEST-1)
- ☐ PESTICIDE GPC CALIBRATION (FORM IX PEST-2)
- ☐ PESTICIDE IDENTIFICATION SUMMARY SINGLE COMPONENT ANALYTES (FORM X PEST-1)
- ☐ PESTICIDE IDENTIFICATION SUMMARY MULTICOMPONENT ANALYTES (FOR X PEST-2)
- ☐ CHROMATOGRAMS AND DATA SYSTEM PRINTOUTS
- ☐ RETENTION TIMES AND CORRESPONDING PEAK AREAS PRINTOUTS
- ☐ PESTICIDE GPC CALIBRATION DATA

DATA PACKAGE COMPLETENESS CHECKLIST (CONT.)
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S):

PESTICIDES AND PCBs

- ☐ VD. RAW QC DATA
  - ☐ BLANK DATA
    - ☐ TABULATION RESULTS (FORM I PEST)
    - ☐ CHROMATOGRAMS AND DATA SYSTEM PRINTOUTS
    - ☐ RETENTION TIMES AND CORRESPONDING PEAK AREAS PRINTOUTS
  - ☐ MATRIX SPIKE DATA
    - ☐ CHROMATOGRAMS AND DATA SYSTEM PRINTOUTS
  - ☐ MATRIX SPIKE DUPLICATE DATA
    - ☐ CHROMATOGRAMS AND DATA SYSTEM PRINTOUTS
  - ☐ INSTRUMENT SETTINGS
  - ☐ INSTRUMENT RUN LOGS
  - ☐ SAMPLE EXTRACTION/PREPARATION LOGS
  - ☐ PERCENT SOLIDS DETERMINATION LOGS
- ☐ VE. SAMPLE RECEIPT
  - ☐ TRAFFIC REPORTS
  - ☐ SAMPLE LOG IN RECORD
- ☐ VF. NONCONFORMANCE RECORDS / CORRESPONDENCE / TELEPHONE COMMUNICATIONS RECORDS / ETC. [1]

Laboratory Reviewer: _____ Date: _____

WESTON Verified By: _____ Date: _____

Comments: _____

[1] Any records not specified, but pertaining to the sample analysis

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

ANION (circle): NO_2-NO_3 SO4 Cl F TOC

NITRATE-NITRITE, SULFATE, CHLORIDE, FLOURIDE, TOTAL ORGANIC CARBON

☐ TABLE OF CONTENTS (CHECK LIST)

☐ I. CASE NARRATIVE

- ☐ COVER PAGE
- ☐ CASE NARRATIVE
- ☐ CROSS REFERENCE OF SAMPLE ID TO LABORATORY ID
- ☐ DESCRIPTION OF ALL QUALIFIERS USED BY THE LABORATORY
- ☐ APPLICABLE LABORATORY SOP AND REVISION DATE
- ☐ SUMMARY OF SAMPLE RESULTS
- ☐ SUMMARY OF QUALITY CONTROL RESULTS
- ☐ SUMMARY OF ANALYSIS AND PREPARATION DATES

☐ IIA.SAMPLE DATA

- ☐ EXAMPLE CALCULATION SHEET
- ☐ INSTRUMENT SETTINGS
- ☐ ANALYTICAL RAW DATA (BEHIND EACH RESULT)

☐ IIB.STANDARDS DATA

- ☐ STANDARDS PREPARATION DATA
- ☐ INITIAL AND CONTINUING CALIBRATION

☐ IIC.RAW QC DATA

- ☐ QUALITY CONTROL RESULTS (BLANKS, LCS, MS/MSD, REPLICATE {TOC ONLY})
- ☐ QUALITY CONTROL RAW DATA (BEHIND EACH RESULT)
- ☐ INSTRUMENT RUN LOGS/INSTRUMENT CALIBRATION/TUNING
- ☐ SAMPLE PREPARATION/EXTRACTION/DISGESTION LOGS
- ☐ PERCENT SOLIDS DETERMINATION LOGS

DATA PACKAGE COMPLETENESS CHECKLIST (CONT.)
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

ANION (circle): NO_2-NO_3 SO4 Cl F TOC

NITRATE-NITRITE, SULFATE, CHLORIDE, FLOURIDE, TOTAL ORGANIC CARBON

☐ III. SAMPLE RECEIPT

- ☐ TRAFFIC REPORTS
- ☐ SAMPLE LOG IN RECORD

☐ IV. NONCONFORMANCE RECORDS / CORRESPONDENCE / TELEPHONE COMMUNICATIONS RECORDS / ETC. [1]

Laboratory Reviewer: _____ Date: _____

WESTON Verified By: _____ Date: _____

Comments: _____

[1] Any records not specified, but pertaining to the sample analysis

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

EXPLOSIVES (USATHAMA AND PETN)

☐ TABLE OF CONTENTS (Checklist)

☐ I. CASE NARRATIVE

- ☐ COVER PAGE
- ☐ CASE NARRATIVE
- ☐ CROSS REFERENCE OF SAMPLE ID TO LABORATORY ID
- ☐ DESCRIPTION OF DATA QUALIFIERS USED IN THE REPORT
- ☐ APPLICABLE LABORATORY SOP AND REVISION DATE
- ☐ SUMMARY OF SAMPLE RESULTS
- ☐ SUMMARY OF QUALITY CONTROL RESULTS
- ☐ SUMMARY OF ANALYSIS AND PREPARATION DATES

☐ IIA.SAMPLE DATA

- ☐ EXAMPLE CALCULATION
- ☐ INSTRUMENT SETTINGS
- ☐ ANALYTICAL RAW DATA (BEHIND EACH RESULT)

☐ IIB.STANDARDS DATA

- ☐ STANDARDS PREPARATION DATA
- ☐ INITIAL AND CONTINUING CALIBRATION
- ☐ RETENTION TIME WINDOWS
- ☐ INSTRUMENT CALIBRATION / TUNING
- ☐ RAW DATA BEHIND EACH RESULT

☐ IIC.RAW QC DATA

- ☐ QUALITY CONTROL RESULTS (BLANKS, LCSs, MS / MSDs)
- ☐ QUALITY CONTROL RAW DATA (BEHIND EACH RESULT)
- ☐ INSTRUMENT RUN LOG
- ☐ SAMPLE PREPARATION / EXTRACTION / DIGESTION LOGS
- ☐ PERCENT SOLIDS DETERMINATION LOGS

☐ III. SAMPLE RECEIPT

- ☐ TRAFFIC REPORTS
- ☐ SAMPLE LOG IN RECORD

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

EXPLOSIVES (USATHAMA AND PETN)

☐ IV. NONCONFORMANCE RECORDS / CORRESPONDENCE / TELEPHONE COMMUNICATIONS RECORDS / ETC.[1]

Laboratory Reviewer: _____ Date: _____

WESTON Verified By: _____ Date: _____

Comments: _____

[1] Any records not specified, but pertaining to the sample analysis

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

RADIOISOTOPES

☐ TABLE OF CONTENTS

☐ I. CASE NARRATIVE

- ☐ COVER PAGE
- ☐ CASE NARRATIVE
- ☐ CROSS REFERENCE OF SAMPLE ID TO LABORATORY ID
- ☐ DESCRIPTION OF DATA QUALIFIERS USED IN THE REPORT
- ☐ SUMMARY OF SAMPLE RESULTS
- ☐ SUMMARY OF QUALITY CONTROL RESULTS
- ☐ SUMMARY OF ANALYSIS AND PREPARATION DATES
- ☐ APPLICABLE LABORATORY SOP AND REVISION DATE

☐ IIA. SAMPLE DATA

- ☐ EXAMPLE CALCULATION PAGE
- ☐ TRITIUM CALCULATION AND RESULT SHEET (RAW DATA PART OF STANDARDS DATA)
- ☐ GAMMA - SPECTROMETRY (RESULTS FOLLOWED BY RAW DATA)
- ☐ ALPHA - SPECTROMETRY (RESULTS FOLLOWED BY RAW DATA)
- ☐ Sr-90 (RAW DATA PART OF STANDARDS DATA)
- ☐ Ra-226 (RAW DATA PART OF STANDARDS DATA)
- ☐ Am-241 (RAW DATA PART OF STANDARDS DATA)
- ☐ SAMPLE PREPARATION / EXTRACTION / DIGESTION LOGS
- ☐ PERCENT SOLIDS DETERMINATION
- ☐ INSTRUMENT RUN LOGS

☐ IIB. STANDARDS DATA

MONTHLY COMPILATION PROVIDED SEPARATELY

☐ IIC. RAW QC DATA

- ☐ QUALITY CONTROL RESULTS (BLANKS, MS/MSD, REPLICATE)
- ☐ QUALITY CONTROL RAW DATA (BEHIND EACH RESULT)

☐ III. SAMPLE RECEIPT

- ☐ TRAFFIC REPORTS
- ☐ SAMPLE LOG IN RECORD

DATA PACKAGE COMPLETENESS CHECKLIST
EG&G MOUND PROJECT

DATE: _____ W.O.#: _____

LABORATORY BATCH #: _____ OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: _____ COLLECTION DATE(S): _____

RADIOISOTOPES

☐ IV. NONCONFORMANCE RECORDS / CORRESPONDENCE / TELEPHONE COMMUNICATIONS RECORDS / ETC.[1]

Laboratory Reviewer: _____ Date: _____

WESTON Verified By: _____ Date: _____

Comments: _____

[1] Any records not specified, but pertaining to the sample analysis

MOUND

Environmental
Restoration
Program

Validation of Laboratory Data Packages

Method: Q-006

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: QAPP (April 1995)

matrix spike recoveries, laboratory control sample recoveries, etc.). The data quality review may be performed exclusively (no data validation) or as a supplement to a partial data validation effort. Data review is performed by a data reviewer. The default requirements is that 90 percent of the data collected for Mound Plant be reviewed and that 10 percent of the data be validated. The frequency requirements for data review and data validation may be altered by project specific documents such as Sampling and Analysis Plans. The results of the data review are reported in the final report to Mound.

If the data reviewer identifies a systematic problem which can not be adequately assessed through data review and the amount of data validation required for the project is inadequate to assess the impact of the problem, then the data reviewer may recommend additional data validation to the project manager.

3.3 Data Validation

In addition to the data review, data validation may be performed. The default Mound Plant requirement is that 10 percent of the data collected be validated. The portion of data submitted for data validation may be altered by project specific documents such as Sampling and Analysis Plans. The samples which are identified for data validation shall be validated by an organization external to the laboratory.

The selection of samples for full data validation will be systematic. One sample from every 10 samples will be selected for validation. Additionally, the selection will be biased so that approximately 10 percent of each analyte group for each matrix is validated. In situations where fewer than 10 samples are generated from an investigation at least one of the samples will be fully validated with the selection biased so that each analyte for each matrix is validated.

The data validator will validate the sample results following the procedures specified in the applicable project document, for instance the OU9 QAPP, or by the procedures specified in the Compendium. After completing the data validation effort, the validator will report the results in a standard report, i.e. Exhibit 3.1. The validation report will be submitted for final approval to a data validation reviewer. If a systematic deficiency is identified during data validation, the data validator/reviewer may advise the project manager that a larger percentage of the data should be validated. The project manager will evaluate the recommendation for additional data validation and will decide whether additional validation will be performed.

3.4 Electronic Data Validation

Mound does not currently perform electronic data validation.

EXHIBIT 3.1

WESTON MANAGERS DESIGNERS/CONSULTANTS
11840-D KEMPERSPRINGS DRIVE
CINCINNATI, OH 45240-1640
513-825-3440 • FAX: 513-825-3336

EXHIBIT 3.1 EXAMPLE

Lab Batch: 37777

PROJECT:	EG&G MOUND	**WESTON W.O. #:**	05376-045-002
TASK:	ER Program FFTA	**DATE:**	
LABORATORY:	WESTON Analytics, Lionville, PA		
FIELD BATCH:	01		
LAB BATCH:	37777		
ANALYSIS:	Total Petroleum Hydrocarbons (E418.1)		

1. CASE SUMMARY

One soil sample was collected on 01 March 1993 and one water sample was collected on 02 March 1993 for total petroleum hydrocarbon analysis by modified method E418.1.Both samples were assigned laboratory Batch No. 37777.The chain-of-custody documentation indicates the samples were received by the laboratory in good condition.

Sample analysis was performed according to Revision 0 of the EG&G Mound FFTA QAPP (DOE 1994) by WESTON Analytics.The following samples apply to this data validation report:

BATCH 37777

Matrix	Field Identification	Laboratory Identification
Soil	MND55-0001-0001	37777-01
Water	MND55-0001-4001	37777-02

2. DATA COMPLETENESS

A complete data package was received from the laboratory on 15 May 1994.

3. SAMPLE HOLDING TIMES

All samples were extracted and analyzed within the required holding times.

WESTON Preparer: _____ Date: _____

WESTON Reviewer: _____ Date: _____

WESTON MANAGERS DESIGNERS/CONSULTANTS
11840-D KEMPERSPRINGS DRIVE
CINCINNATI, OH 45240-1640
513-825-3440 • FAX: 513-825-3338

EXHIBIT 3.1 EXAMPLE

Lab Batch: 37777

4. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

a. Calibration

All initial and continuing calibration requirements were met for these samples.

b. Laboratory Method Blanks

TPH was not detected in the method blanks above the practical reporting limit.

c. Laboratory Control Sample

TPH recoveries in the laboratory control sample were within required limits.

d. Matrix Spike/Matrix Spike Duplicate Recoveries

Neither sample was submitted for matrix spike analysis.

e. Compound Identification

The target compound was properly identified per E418.1.

f. Quantitation and Contract Required Reporting Limits (CRQL)

The target compound was properly quantitated in the samples and the laboratory reported to the required quantitation limit.

5. RESULTS OF ASSOCIATED FIELD QUALITY CONTROL CHECKS

a. Field Duplicates

No field duplicate was included in this batch.

b. Field Blanks

Sample MND55-0001-4001 is an equipment rinsate; no positive results were reported.

WESTON Preparer: _____ Date: _____

WESTON Reviewer: _____ Date: _____

WESTON MANAGERS DESIGNERS/CONSULTANTS
11840-D KEMPERSPRINGS DRIVE
CINCINNATI, OH 45240-1640
513-825-3440 • FAX: 513-825-3336

EXHIBIT 3.1 EXAMPLE

Lab Batch: 37777

6. OVERALL ASSESSMENT OF THE DATA

The data are acceptable without qualification.

7. REFERENCES

USEPA 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation of Organic Analyses."U. S. Environmental Protection Agency, Hazardous Site Evaluation Division.February 1988.

DOE 1993. Remedial Investigation/Feasibility Study,Operable Unit 9, Quality Assurance Project Plan.Mound Plant, Environmental Restoration Program, U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico.March 1993.

USEPA 1983. "Methods of Chemical Analysis of Water and Wastes," U.S. Environmental Protection Agency, EPA 600/4-79-020, March 1983.

WESTON Preparer: _____ Date: _____

WESTON Reviewer: _____ Date: _____

ATTACHMENT I

PP-1 - Exceeded Holding Times
PP-2 - System Monitoring Compound Recovery Outliers
PP-3 - Matrix Spike Recovery Outliers
PP-4 - Blank Outliers
PP-5 - Calibration Outliers
PP-6 - Instrument Performance Check Outliers
PP-7 - Field Duplicate Outliers
PP-8 - GPC Calibration Check Outliers
PP-9 - Florisil Cartridge Check Outliers
PP-10 - Pesticide Identification Summary Table

ATTACHMENT II

QUALIFIED DATA SUMMARY REPORTS

FORM 1s

EXHIBIT 3.1 EXAMPLE

GLOSSARY OF DATA QUALIFIER CODES

ORGANICS AND INORGANICS

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

J - The associated numerical value is an estimated quantity.

R - The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.

N - Presumptive evidence of presence of material.

NJ - Presumptive evidence of the presence of the material at an estimated quantity.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

SUB-QUALIFIER CODES

ORGANICS

D - Duplicates
B - Qualified due to blank
C - Qualified due to calibration
H - Holding time exceeded
K - Qualified due to surrogate recovery
L - Qualified due to Laboratory Control Sample
S - Qualified due to matrix spike recovery
I - Qualified due to internal standard
N - Tentative identification (only for TICs)
P - Pest/PCB results have >25% difference on two different columns
(+) - Positive bias (added after subqualifier)
(-) - Negative bias (added after subqualifier)

INORGANICS

D - Duplicates
B - Qualified due to blank
C - Qualified due to calibration
H - Holding time exceeded
L - Qualified due to Laboratory Control Sample
S - Qualified due to matrix spike recovery
I - Qualified due to interference
(+) - Positive bias (added after subqualifier)
(-) - Negative bias (added after subqualifier)

ATTACHMENT III

DATA COMPLETENESS CHECKLIST

ATTACHMENT IV

CASE NARRATIVE

ATTACHMENT V

CHAIN-OF-CUSTODY

MOUND

Environmental
Restoration
Program

Method: Q-007

Data Assessment

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: QAPP (April 1995)

1. INTRODUCTION

1.1. Description

This procedure describes the assessment of data qualifications applied during data validation.

2. RESPONSIBILITIES

Data Assessor — The Data Assessor will evaluate relevant quality control data (data validation reports, database quality control reports, etc.). The Assessor will have a minimum of a Bachelors Degree in Chemistry, two years of experience working at a laboratory, and two years experience validating laboratory data.

3. PROCEDURES

3.1. Data Assessment

The data validation program also includes an overall assessment of data. An assessment is performed to evaluate the usability of the qualified data from data validation. Valid data is defined as sample results determined usable. The data assessor will perform an assessment of all data qualified from data validation. The assessor will have a working knowledge of the project data quality objectives and intended data use. The results of the assessment will be summarized and submitted to the project manager.

Results of data validation give an indication of potential error in numerical results if QC checks are outside acceptance criteria. Prior to using the data, the impact of potential errors on the data shall be evaluated. All sample results in laboratory batches with quality control checks not meeting the required acceptance criteria (defined in Section 3 and in the USEPA functional guidelines) will be assessed for potential bias. The impact of the amount of bias will be evaluated with respect to how the results will be used. Table 3.1 summarizes examples of how qualified results may affect common data uses for the Mound ER program.

Because it is possible to qualify data for many different reasons, Table 3.1 is not inclusive of all assessment evaluations. The decision tree used for assessing data usability will vary depending on the intended data use. However, every data assessment performed will summarize the assessment results and the basis used for rejecting any data beyond what data validators reject. Qualified data which indicate a bias that causes the sample result to be potentially near or above the action level, or leads to inconclusive results for other data uses, will be unusable for the particular data use.

Table 3.1 Examples of the Data Assessment Process

Data Qualification	Reason Qualified	Data Use	How Data is Assessed	Example of Unusable Data	Example of Usable Data
UJ, J	Calibration, matrix spike recovery, chromatographic resolution, and poor interferences.	Compare to an action level.	The amount of bias is evaluated to determine its impact on the comparison. See footnote[a].	Result: 100 ppb Action Limit: 200 ppb MS Recovery: 40% Result may be biased low and correction for maximum bias yields a result greater than action limit.	Result: 100 ppb Action Limit: 400 ppb MS Recovery: 74% Result may be biased low, but correction for maximum bias yields a result less than the action limit.
		Identify nature and extent of contamination.	The amount of bias is evaluated and summarized.	Result: 5 U Action Limit: NA MS Recovery: 1% Low matrix spike recovery is not necessarily representative of all samples in the lab batch. However, low recovery was noted as a trend in several lab batches therefore data are rejected. See footnote[b].	Result: 10 ppb Action Limit: NA MS Recovery: 5% Low matrix spike recovery, but analyte was detected. Data usable as indication of presence of contaminant. Indicate probable bias for data use.
UJ, J	Holding Time.	Compare to an action level.	The target analytes are evaluated for the likelihood of degradation. The reported concentration is compared to action level.	Result: 100 ppb Action Limit: 120 ppb Compound: N-nitroso-di-n-propylamine Days Exceeded: 40 Criteria: 14 days extraction The compound is reactive to light and deteriorates quickly. Because of potential low bias and grossly exceeded hold time, and proximity to the action limit, the result is rejected.	Result: 5 ppb Action Limit: 50 ppb Compound: Aroclor 1260 Days Exceeded: 30 The compound is stable over time and is not near the action limit. The result is considered usable.
		Identify nature and extent of contamination.	The compound is evaluated for likelihood of degradation.	Result: 5 U Action Limit: NA Compound: Freon-113 Days Exceeded: 30 Criteria: 14 days analysis Freon-113 is likely to volatilize. Hold time is grossly exceeded. Result is considered unusable.	Result: 100 ppb Action Limit: NA Compound: Freon-113 Days Exceeded: 30 Since compound is detected, but not compared to a numerical value, the result is considered useable.

Table 3.1 Examples of the Data Assessment Process (cont.)

Data Qualification	Reason Qualified	Data Use	How Data is Assessed	Example of Unusable Data	Example of Usable Data
U	Method blank or field blank contamination and interferences.	Compare to an action level.	The impact of a raised reporting limit due to contamination of interference is evaluated against action limit.	Result: 110 ppb Action Limit: 100 ppb MS Recovery: 35 ppb Validator has qualified the data 100 U due to blank contamination. Since the reporting limit is greater than the action limit, the data is considered unusable.	Result: 110 ppb Action Limit: 200 ppb MS Recovery: 35 ppb Validator has marked the data 100 U due to blank contamination. Since the reporting limit did not exceed the action limit, the data is considered usable.
		Identify nature and extend of contamination.	The reporting limit is raised due to contamination or interference.	No Case: Note raised reporting limit for data users.	No Case: Note raised reporting limit for data users.
N, NJ	Tentatively identified compound outside target list. Quantitation estimated.	Compare to an action level.	The amount of bias is evaluated to determine its impact on the comparison.	Result: 100 ppb Action Limit: 100 ppb Sample result is inconclusive. Result is not considered usable.	Result: 100 ppb Action Limit: 1000 ppb Data is considered usable since the action level is an order of magnitude higher than the result.
		Identify nature and extent of contamination.	The amount of bias is evaluated and summarized.	Sample result is considered usable for tentative identification.	Sample result is considered usable for tentative identification.
R	All Cases	All Cases	No assessment	Data is considered unusable.	Data is considered unusable.

Note: This table does not reflect the complete data assessment process since it is case dependent. However, the table provides examples of how sample bias can be evaluated for data users.

[a] There are laboratory QC results where the amount of bias cannot be quantitatively or qualitatively evaluated. In these cases, the sample result will be flagged as having potential, indeterminable bias.

[b] All sample results with no detections and significantly low MS recoveries will be suspect, and evaluated on a case by case basis.

MOUND

Environmental
Restoration
Program

Method: Q-008

Data Integrity Verification

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: Compendium (November 1996)

1. INTRODUCTION

This procedure describes how laboratory data and field data entered into the Mound Environmental Information Management System (MEIMS) will be verified. This procedure applies to the entry of data into a data shell, a stand-alone version of the MEIMS database. The procedure assumes that no verification is necessary for the merger of the shell with the parent database.

2. RESPONSIBILITIES

Data Entry Clerk - The data entry clerk is responsible for accurately entering and/or loading data into the MEIMS shell. After loading the data into the database, the entry clerk will generate a printout of the data and initiate a verification tracking form (included on page 3 herein).

Verification Clerk - Verification data entry clerk is responsible for checking the data loaded into the database shell against the source hardcopy data, i.e. a laboratory summary report, a field datasheet, etc. The verification clerk is also responsible for completing the verification tracking form and initiating corrective actions for data entry errors.

Database Manager - The database manager is responsible for ensuring that the verification system is being implemented as outlined in this procedure and for merging the database shell with MEIMS.

3. PROCEDURES

3.1 Data Sources

Data may originate from a survey crew, field sampling crew, on-site analysis, off-site analysis, or other source. Except for the data generated by off-site laboratory analyses, all the data will have to be manually keyed (entered) into the database shell. Off-site laboratory data will be provided as a floppy disk deliverable in a Mound defined format.

3.2 Data Entry

The majority of the data will be delivered on diskette from off-site laboratories. Provided the data are properly formatted on the floppy diskette, the data can be easily entered into the database shell. If the data are improperly formatted on the diskette, then the laboratory must either submit a corrected floppy disk, the data must be manually keyed into the data system, or the incorrectly formatted data on the diskette must be fixed. If the data are improperly formatted on the diskette, a *Corrective Action Report* must be issued as described in Method Q-001.

The field data, sample coordinates, and on-site sample results may not be available in a compatible electronic format which can be easily loaded into the data system. These data points will have to be manually keyed into the data system by a data entry clerk.

3.3 Verification Process

3.3.1 Verification Against On-Line Display

After the data entry clerk has completed loading or entering the data, he will initiate a data verification form. The data verification form, and a copy of the raw data (laboratory data summary, field sheets, etc.) will be given to a verification clerk.

The verification clerk will compare the database entries to the raw data. If the verification clerk finds errors, she will mark the corrections and give the data verification package with the corrections back to the data entry clerk. The data entry clerk will enter any required corrections, and submit the verification package back to the verification clerk. If the verification clerk does not find any errors in the database entries, he/she will sign the verification form and submit the data verification package to the project file.

3.3.2 Verification Against Database Printout

If the data integrity is not verified by comparing a hardcopy (original) data report directly to data in the database which is displayed to a CRT, then the entry clerk is responsible for generating a printout of the database entries. The printout will be attached to the verification form and the raw data and processed as described in 3.3.1.

Mound Environmental Information Management System
Data Verification Check Sheet

General Project Information	
Project:	**Date:**
Work Order:	**File Code:**
Initial Data Entry Clerk:	
Type of Data: Laboratory (EDD) Field (Field Sheets) On-Site (Data Sheets) Survey (Data Sheets) Laboratory (Manual Entry) Other	
Batch Description:	
Data Entry Verification - Initial Review	
Data Entry Reviewer:	**Date:**
Status: **Approved Rejected**	
Data Entry Correction 1	
Data Entry Clerk	**Date:**
Data Correction Entry Verification	
Data Entry Reviewer:	**Date:**
Status: **Approved Rejected**	
Data Entry Correction 2	
Data Entry Clerk	**Date:**
Data Correction Entry Verification	
Data Entry Reviewer:	**Date:**
Status: **Approved Rejected**	

MOUND

Environmental
Restoration
Program

Method: Q-009

Field Data Validation

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: QAPP (April 1995)

1. INTRODUCTION

1.1. Description

This procedure outlines the field data validation requirements. These requirements were originally developed and included in the OU9 QAPP (DOE 1995)

1.2. References

DOE 1995, "Remedial Investigation/Feasibility Study Operable Unit 9, Site-Wide Quality Assurance Project Plan," Final Revision 4, U. S. Department of Energy, April 1995.

2. RESPONSIBILITIES

Field Team Leader — The designated field team leader is responsible for performing the data validation described in this procedure. If the field team leader originated the field data or if no field team leader is designated, then the project manager is responsible for the specified validation.

3. PROCEDURES

Review of technical data integrity will be performed at two levels. On the first level, at the time of collection, field personnel will verify that standard operating procedures are followed, all data are recorded and quality control checks are performed and all forms and notebooks are signed and dated on the day recorded. The field personnel will also evaluate the data for obvious problems. At the second level, data will be reviewed by the field team leader, who will ensure that all data are recorded and reported correctly, including calculations and sample collection information.

3.1. Data Validation during Sample Collection

Data validation during sample collection is limited to verifying the proper operating procedures are being followed, data are being properly recorded, and the field quality control checks are within criteria and no obvious anomalies are encountered. Occasionally a field measurement will result in a value significantly outside the expected range for most field conditions, an outlier. An example of an outlier is a zero reading for specific conductance. When an outlier is identified by the field team, the outlier will be recorded as any other field measurement, the field instrumentation and the instrument calibrations will be checked, and the parameter will be re-measured at least twice. If the two additional measurements match the original measurement, the initial result will be considered valid. If the two additional measurements do not match the outlier, then the initial result will be considered invalid.

No other validation will be performed by the field team while collecting samples.

3.2. Data Validation

The field team leader is responsible for performing data validation on both objective and subjective data.

3.2.1. Objective Data Validation

The field team leader will review all forms and notebooks to verify that the data are properly recorded and complete. If a calculation has been performed by a field team member, the field team leader will verify that the equation for the calculation is included in the records and re-calculate **10 percent** of the reported results. If a deficiency is identified by the field team leader, the field team leader will correct the deficiency and implement a corrective measure to prevent recurrence.

3.2.2. Subject Data Validation

The team leader will review all forms and notebooks to verify that the data are properly recorded and complete. Additionally, for subjective data the field team leader will review the data for reasonableness. If a discrepancy is found, the field team leader will implement a corrective measure. An example of subjective data are lithologic descriptions of samples. In the event the lithology of samples were being described during a field event, the field team leader may choose to inspect several logbooks at random intervals to ensure that the descriptions are consistent within the field team.

3.3. Data Entry

After the validity of data in the field notes and on ER Program forms has been evaluated according to the procedures described above, the data administrator will tabulate the data, wherever possible, by entering the data in computer data files. All data hand-entered into the computer files will be checked 100 percent by another individual. Where appropriate, the data files will be set up for direct input into the project database. Subjective data will be filed as hard copies for later review by the project manager and for incorporation into technical reports, as appropriate.

MOUND

Environmental
Restoration
Program

Method: Q-012

Electronic Data Deliverable Format Specification - MEIMS Non-CLP Standard Format

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: Compendium (November 1996)

1. INTRODUCTION

This procedure contains the specifications for the standard Mound Environmental Information Management System (MEIMS) non-CLP electronic data deliverable (EDD) format. Quality Method Q-013 describes an alternate deliverable format which can be used for non-CLP analyses. The alternative specification should only be used if the laboratory is unable to meet the specifications in this procedure.

2. RESPONSIBILITIES

Laboratory Reporting Staff — The reporting staff is responsible for accurately transferring the laboratory data to 3.5 inch floppy diskettes in the format specified in this procedure.

Database Clerk — The database clerk is responsible for loading the EDD into MEIMS and reporting entry errors to the database administrator.

Database Administrator — The database administrator is responsible for maintaining the format specification in this procedure and resolving laboratory EDD problems. The database administrator may designate an individual to resolve laboratory EDD problems.

3. PROCEDURE

The EDDs for the MEIMS are prepared at the laboratory and stored on 3-1/2 inch floppy disks. EDDs for non-CLP data shall follow a specified format. The following sections describe the format for each data record including the fields and allowable codes for each field.

Section 3.1 lists each field, the position of the field, and the field length. The section also identifies the source of the field information, shows an example for each field, and identifies whether the field is required.

3.1. Non-CLP Record Format

Field Description	Position	Length	Source	Example	Required**
Header Record*					
Project Number	1-20	20	CONTRACT	E123A1156	Opt
Submission Date	21-28	8	LAB	12/30/93	Opt
Number of records	29-33	6	LAB	1235	Opt
Detail Record					
Client Sample ID	1-20	20	COC	900123	Mand
Date Collected	21-28	8	COC	11/23/93	Mand***
Time Collected	29-33	5	COC	1300	Opt
Lab Batch/SDG Number	34-48	15	LAB	50071	Mand
Matrix	49-56	8	COC	WATER	Mand
Lab Sample ID	57-76	20	LAB	CC113091	Mand
Lab Code	77-81	5	VALID CODE LIST	COMPUC	Mand

Field Description	Position	Length	Source	Example	Required**
Date Extracted/Prepared	82-89	8	LAB	12/10/93	Opt
Date Analyzed	90-97	8	LAB	12/12/93	Mand
Time Analyzed	98-102	5	LAB	1200	Mand
Lab Blank Sample Number	103-122	20	LAB	CC113124	Mand
Analysis Type Code	123-132	10	VALID CODE LIST	ORVOA	Opt
Result Type Code	133-135	3	VALID CODE LIST	REG	Mand
Parameter Code	136-146	11	VALID CODE LIST	100-41-4	Mand
Result	147-156	10	LAB	10.0	Mand
Result Qualifier Code	157-161	5	VALID CODE LIST	U	Mand
Uncertainty	162-171	10	LAB	0.0025	Opt
Unit of Measure Code	172-179	8	VALID CODE LIST	UG/L	Mand
Retention Time (TICs only)	180-186	7	LAB	2330	Opt
Analyte Name	187-216	30	VALID CODE LIST	Endrin	Mand
Detection Limit	217-226	10	LAB	10.0	Mand
Method	227-236	10	LAB	SW8020	Mand
Percent Solids	237-241	5	LAB	82.3	Opt
Sample Weight/Volume	242-246	5	LAB	5.0	Mand
Weight/Volume Units	247-248	2	LAB	G	Mand
Dilution	249-253	5	LAB	1.0	Mand

* If the header is not used, leave the first line blank

** Opt = Optional, Mand = Manditory. The optional fields may be lab/matrix/method dependent. The fields become required when the associated lab/matrix/method dictates.

*** The data collected must have a date entered, or if the date is unknown, the date format must be entered i.e. " / / ".

CONTRACT — indicates the data is found on the laboratory subcontract.

LAB — indicates the information is provided by the laboratory.

COC — indicates that the data are found on the Chain-of-Custody form.

VALID CODE LIST — indicates that only codes listed in the valid codes list are to be used. In case where a code definition does not meet the needs of the data recorded, the data administrator will be contacted so that concurrence can be obtained in establishing required coding conventions. ASCII data files that contain all valid code lists will be provided to all participating labs. See Section 3.3 for the valid code lists.

The following conventions must be used:

- The code LCS must be used as the sample ID for blank spikes — spikes that do not involve true environmental samples from Mound. A sample type of LCS must be used for blank spikes.

- The code BLK must be used as the sample ID for method blanks. A sample type of BLK must also be used.

- The code MS must be appended to the end of the sample ID for matrix spikes — spikes of real environmental samples from Mound. A sample type of SPK must be used for matrix spikes.

3.2. Field Definitions

Field Description	Field Definition
Header Record	
Project Number	Laboratory subcontract number for this project.
Submission Date	Date the data were submitted.
Number of records	Number of detail records in this file.
Detail Record	
Client Sample ID	Sample identifier assigned by the client.
Analysis Type Code	Code identifying the type of analysis performed on the sample.
Date Collected	Date sample was collected.
Time Collected	Time sample was collected.
Lab Case Number	Laboratory case number for this data submittal.
Lab Batch/SDG Number	Laboratory sample delivery group number or batch number.
Matrix	Sample matrix as specified on the Chain-of-Custody.
Lab Sample ID	Sample identifier assigned by the laboratory.
Lab Code	Code identifying the laboratory.
Date Extracted/Prepared	Date the sample was extracted.
Date Analyzed	Date the sample was analyzed.
Time Analyzed	Time the sample was analyzed.
Lab Blank Sample Number	Sample identifier for the laboratory blank associated to this sample.
Result Type Code	Code identifying the type of laboratory result.
Parameter Code	Code identifying the parameter.
Result	Result of the parameter for the sample.
Result Qualifier	Laboratory qualifier for the result.
Uncertainty	2 sigma error for radiological results.
Unit of Measure	Code identifying the unit of measure.
Retention Time (TICs only)	Retention time for tentatively identified compounds.
Detection Limit	Detection limit associated with the parameter results.
Method	Analytic method of analysis. Lab SOP if not standard method.
Percent Solids	The solid fraction of a non-aqueous sample. Blank if aqueous.
Sample Weight/Volume	The weight or volume of the sample.
Weight/Volume Units	Unit of measure of the sample weight or volume.
Dilution	Dilution factor associated with the parameter results.

3.3. Valid Code Lists

3.3.1. Result Types

Code	Description
BLK	Method Blank
DIL	Dilution
DUP	Analytical Duplicate
LCS	Lab Control Sample / Blank Spikes

Code	Description
PB	Prep blank
R1	Replicate Sample
REA	Reanalyzed Sample
REG	Regular Sample or Reported Value if Reanalyzed
SPK	Matrix Spike / Matrix Spike Duplicate
TIC	Tentatively Identified Compound

3.3.2. Analysis Types

Code	Description
ANION	Common Anions
EPTOX	EP TOX Leachate
GENERA	General Chemistry
GEOTEC	Geotechnical
INORG	Metals
OILGRS	Oil and Grease
ORBTEX	BTEX Compounds
ORDIOX	Dioxins/Dibenzofurans
ORDRO	Diesel Range Organics
OREXP	Explosives
ORGRO	Gasoline Range Organics
ORHERB	Herbicides
ORMORO	Motor Oil Range Organics
ORMRO	Motor Oil Range Organics
ORPETH	Petroleum Hydrocarbons
ORPHNL	Phenols
ORPPB	Pesticides and/or PCBs
ORSVO	Semi-Volatile Organics
ORVOA	Volatile Organics
OTHER	Other
RAD	Radiological
TCLPHB	TCLP Herbicides
TCLPIN	TCLP Metals
TCLPPP	TCLP PCBs
TCLPR	TCLP Reactivity, Corrosivity
TCLPSV	TCLP Semi-Volatiles
TCLPVO	TCLP Volatiles

3.3.3. Parameter Codes

Code	Parameter name
100	% Clay
54100	% Gravel
8000	% Sand
8400	% Silt
630-20-6	1,1,1,2-Tetrachloroethane
71-55-6	1,1,1-Trichloroethane
79-34-5	1,1,2,2-Tetrachloroethane
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane
79-00-5	1,1,2-Trichloroethane
75-34-3	1,1-Dichloroethane

Code	Parameter name
75-35-4	1,1-Dichloroethene
563-58-6	1,1-Dichloropropene
35822-46-9	1,2,3,4,6,7,8-HpCDD
67562-39-4	1,2,3,4,6,7,8-HpCDF
55673-89-7	1,2,3,4,7,8,9-HpCDF
39227-28-6	1,2,3,4,7,8-HxCDD
70648-26-9	1,2,3,4,7,8-HxCDF
57653-85-7	1,2,3,6,7,8-HxCDD
57117-44-9	1,2,3,6,7,8-HxCDF
19408-74-3	1,2,3,7,8,9-HxCDD
72918-21-9	1,2,3,7,8,9-HxCDF
40321-76-4	1,2,3,7,8-PeCDD
57117-41-6	1,2,3,7,8-PeCDF
87-61-6	1,2,3-Trichlorobenzene
96-18-4	1,2,3-Trichloropropane
120-82-1	1,2,4-Trichlorobenzene
95-63-6	1,2,4-Trimethylbenzene
156-59-2	1,2-cis-Dichloroethene
96-12-8	1,2-Dibromo-3-chloropropane
106-93-4	1,2-Dibromoethane
95-50-1	1,2-Dichlorobenzene
2199-69-1	1,2-Dichlorobenzene-d4
107-06-2	1,2-Dichloroethane
17060-07-0	1,2-Dichloroethane-d4
540-59-0	1,2-Dichloroethene
78-87-5	1,2-Dichloropropane
135-01-3	1,2-Diethylbenzene
156-60-5	1,2-trans-Dichloroethene
108-67-8	1,3,5-Trimethylbenzene
99-35-4	1,3,5-Trinitrobenzene
10061-01-5	1,3-cis-Dichloropropene
541-73-1	1,3-Dichlorobenzene
142-28-9	1,3-Dichloropropane
141-93-5	1,3-Diethylbenzene
99-65-0	1,3-Dinitrobenzene
10061-02-6	1,3-trans-Dichloropropene
106-46-7	1,4-Dichlorobenzene
105-05-5	1,4-Diethylbenzene
544-10-5	1-Chlorohexane
108-60-1	2,2'-oxybis(1-chloropropane)
594-20-7	2,2-Dichloropropane
60851-34-5	2,3,4,6,7,8-HxCDF
57117-31-4	2,3,4,7,8-PeCDF
1746-01-6	2,3,7,8-TCDD
51207-31-9	2,3,7,8-TCDF
95-95-4	2,4,5-Trichlorophenol
118-79-6	2,4,6-Tribromophenol
88-06-2	2,4,6-Trichlorophenol
118-96-7	2,4,6-Trinitrotoluene
120-83-2	2,4-Dichlorophenol
105-67-9	2,4-Dimethylphenol
51-28-5	2,4-Dinitrophenol

Code	Parameter name
121-14-2	2,4-Dinitrotoluene
606-20-2	2,6-Dinitrotoluene
35572-78-2	2-Amino-4,6-dinitrotoluene
120-32-1	2-Benzyl-4-Chlorophenol
78-93-3	2-Butanone
110-75-8	2-Chloroethylvinylether
91-58-7	2-Chloronaphthalene
95-57-8	2-Chlorophenol
93951-73-6	2-Chlorophenol-d4
95-49-8	2-Chlorotoluene
321-60-8	2-Fluorobiphenyl
367-12-4	2-Fluorophenol
591-78-6	2-Hexanone
91-57-6	2-Methylnaphthalene
95-48-7	2-Methylphenol
88-74-4	2-Nitroaniline
88-75-5	2-Nitrophenol
88-72-2	2-Nitrotoluene
91-94-1	3,3'-Dichlorobenzidine
618-87-1	3,5-Dinitroaniline
99-09-2	3-Nitroaniline
99-08-1	3-Nitrotoluene
72-54-8	4,4'-DDD
72-55-9	4,4'-DDE
50-29-3	4,4'-DDT
534-52-1	4,6-Dinitro-o-Cresol
1946-51-0	4-Amino-2,6-Dinitrotoluene
101-55-3	4-Bromophenyl-phenyl Ether
59-50-7	4-chloro-3-methylphenol
106-47-8	4-Chloroaniline
7005-72-3	4-Chlorophenyl-phenylether
106-43-4	4-Chlorotoluene
108-10-1	4-Methyl-2-pentanone
106-44-5	4-Methylphenol
100-01-6	4-Nitroaniline
100-02-7	4-Nitrophenol
99-99-0	4-Nitrotoluene
83-32-9	Acenaphthene
208-96-8	Acenaphthylene
67-64-1	Acetone
75-05-8	Acetonitrile
107-13-1	Acrylonitrile
AC-227	Actinium-227
14331-83-0	Actinium-228
309-00-2	Aldrin
ALK	Alkalinity
ALHCO3	Alkalinity: HCO3
5103-71-9	Alpha Chlordane
ALPHA	Alpha, Total
319-84-6	Alpha-BHC
7429-90-5	Aluminum
14596-10-2	Americium-241

Code	Parameter name
AMM	Ammonia
120-12-7	Anthracene
7440-36-0	Antimony
SB-124	Antimony-124
SB-125	Antimony-125
12674-11-2	Aroclor-1016
11104-28-2	Aroclor-1221
11141-16-5	Aroclor-1232
53469-21-9	Aroclor-1242
12672-29-6	Aroclor-1248
11097-69-1	Aroclor-1254
11096-82-5	Aroclor-1260
7440-38-2	Arsenic
7440-39-3	Barium
BA-133	Barium-133
BA-140	Barium-140
71-43-2	Benzene
92-87-5	Benzidine
56-55-3	Benzo(a)anthracene
50-32-8	Benzo(a)pyrene
205-99-2	Benzo(b)fluoranthene
191-24-2	Benzo(g,h,i)perylene
207-08-9	Benzo(k)fluoranthene
65-85-0	Benzoic Acid
100-51-6	Benzyl Alcohol
7440-41-7	Beryllium
13966-02-4	Beryllium-7
BETA	Beta, Total
319-85-7	Beta-BHC
BOD	Bio Oxygen Demand
111-91-1	Bis(2-chloroethoxy)methane
111-44-4	Bis(2-chloroethyl)ether
117-81-7	Bis(2-ethylhexyl)phthalate
7440-69-9	Bismuth
BI-207	Bismuth-207
BI-210	Bismuth-210
BI-210M	Bismuth-210M
BI-211	Bismuth-211
14913-49-6	Bismuth-212
14733-03-0	Bismuth-214
7440-42-8	Boron
108-86-1	Bromobenzene
74-97-5	Bromochloromethane
75-27-4	Bromodichloromethane
460-00-4	Bromofluorobenzene
75-25-2	Bromoform
74-83-9	Bromomethane
85-68-7	Butyl Benzyl Phthalate
C4C8	C4-C8 Cycloalkanes/Alkenes
7440-43-9	Cadmium
7440-70-2	Calcium
86-74-8	Carbazole

Code	Parameter name
75-15-0	Carbon Disulfide
56-23-5	Carbon Tetrachloride
153861900	Cation Exchange
CEC	Cation Exchange Capacity as Na
CERADA	Ceridaphnia
7440-45-1	Cerium
CE-139	Cerium-139
CE-141	Cerium-141
CE-144	Cerium-144
13967-70-9	Cesium-134
10045-97-3	Cesium-137
COD	Chemical Oxygen Demand
57-74-9	Chlordane
CL	Chloride
7782-50-5	Chlorine
108-90-7	Chlorobenzene
75-00-3	Chloroethane
67-66-3	Chloroform
74-87-3	Chloromethane
25168-05-2	Chlorotoluene
7440-47-3	Chromium
CR6	Chromium, Hexavalent
CR-51	Chromium-51
218-01-9	Chrysene
7440-48-4	Cobalt
CO-57	Cobalt-57
CO-58	Cobalt-58
10198-40-0	Cobalt-60
7440-50-8	Copper
57-12-5	Cyanide
2051-24-3	Decachlorobiphenyl
319-86-8	Delta-BHC
84-74-2	Di-n-butyl Phthalate
117-84-0	Di-n-octyl Phthalate
53-70-3	Dibenzo(a,h)anthracene
132-64-9	Dibenzofuran
124-48-1	Dibromochloromethane
74-95-3	Dibromomethane
75-71-8	Dichlorodifluoromethane
60-57-1	Dieldrin
DRO	Diesel Range Organics
84-66-2	Diethyl Phthalate
131-11-3	Dimethyl Phthalate
DO	Dissolved Oxygen
TDS	Dissolved Solids
7429-91-6	Dypsprosium
ECOLI	E. Coli
959-98-8	Endosulfan I
33213-65-9	Endosulfan II
1031-07-8	Endosulfan Sulfate
72-20-8	Endrin
7421-93-4	Endrin Aldehyde

Code	Parameter name
53494-70-5	Endrin Ketone
7440-52-0	Erbium
100-41-4	Ethylbenzene
7440-53-1	Europium
14683-23-9	Europium-152
15585-10-1	Europium-154
EU-155	Europium-155
FECAL	Fecal Coliform Bacteria
206-44-0	Fluoranthene
86-73-7	Fluorene
FL	Fluoride
462-06-6	Flurobenzene
7440-54-2	Gadolinium
GD-153	Gadolinium-153
5103-74-2	Gamma Chlordane
58-89-9	Gamma-BHC (Lindane)
GRO	Gasoline Range Organics
HARDCA	Hardness as CaCO3
76-44-8	Heptachlor
1024-57-3	Heptachlor Epoxide
118-74-1	Hexachlorobenzene
87-68-3	Hexachlorobutadiene
77-47-4	Hexachlorocyclopentadiene
67-72-1	Hexachloroethane
110-54-3	Hexane
2691-41-0	HMX
7440-60-0	Holmium
37871-00-4	HpCDD
38998-75-3	HpCDF
34465-46-8	HxCDD
55684-94-1	HxCDF
193-39-5	Indeno(1,2,3-cd)pyrene
IOD	Iodide
I-131	Iodine-131
74-88-4	Iodomethane
IR-192	Iridium-192
7439-89-6	Iron
FE-59	Iron-59
78-59-1	Isophorone
98-82-8	Isopropyl Benzene
7439-91-0	Lanthanum
LA-140	Lanthanum-140
7439-92-1	Lead
PB-210	Lead-210
15092-94-1	Lead-212
15067-28-4	Lead-214
7439-93-2	Lithium
7439-94-3	Lutetium
13777-61-2	m&p-Xylene
7439-95-4	Magnesium
7439-96-5	Manganese
MN-54	Manganese-54

Code	Parameter name
5711900	Maximum Density
571582400	Maximum Dry Density
7439-97-6	Mercury
HG-203	Mercury-203
72-43-5	Methoxychlor
75-09-2	Methylene Chloride
717423200	Minimum Dry Density
3711900	Minimum Density
45800	Moisture
7439-98-7	Molybdenum
MORO	Motor Oil Range Organics
104-51-8	n-Butylbenzene
621-64-7	N-Nitroso-di-n-propylamine
86-30-6	N-Nitrosodiphenylamine
103-65-1	n-propylbenzene
91-20-3	Naphthalene
7440-00-8	Neodymium
NP-237	Neptunium-237
7440-02-0	Nickel
NB-95	Niobium-95
NO3	Nitrate
NO2/NO3	Nitrate-Nitrite-N
1497-55-8	Nitrate/Nitrite
NO2	Nitrite
98-95-3	Nitrobenzene
4165-60-0	Nitrobenzene-d5
NITROGEN	Nitrogen
55-63-0	Nitroglycerin
348-51-6	O-Chloroflurobenzene
95-47-6	o-Xylene
3268-87-9	OCDD
39001-02-0	OCDF
OIL	Oil
OMC	Optimum Moisture Content
TOC	Organic Carbon
7683200	Organic Content
MOIST	Organic Content / Moisture
99-87-6	p-Isopropyltoluene
36088-22-9	PeCDDI
30402-15-4	PeCDF
87-86-5	Pentachlorophenol
%MOISTURE	Percent Moisture
%SOLIDS	Percent Solids
PERM	Permeability
78-11-5	PETN
1006	pH
85-01-8	Phenanthrene
108-95-2	Phenol
4165-62-2	Phenol-d5
PHENOLICS	Phenolics
PHENOLS	Phenols
PO4T	Phosphate

Code	Parameter name
PHOS	Phosphorous
7723-14-0	Phosphorous
PIMEP	Pimephales
PU-238/239	Plutonium 238/239
13981-16-3	Plutonium-238
PU-239/240	Plutonium-239/240
PU-242	Plutonium-242
PO-210	Polonium-210
1336-36-3	Polychlorinated Biphenyl (PCB)
7440-09-7	Potassium
13966-00-2	Potassium-40
7440-10-0	Praseodym
13981-14-1	Protactinium-233
15100-28-4	Protactinium-234 metastable
15117-48-3	Pu-239
129-00-0	Pyrene
15623-45-7	Radium-223
13233-32-4	Radium-224
RA-225	Radium-225
13982-63-3	Radium-226
RA-228	Radium-228
121-82-4	RDX
EH	Redox Potential
RU-103	Ruthenium-103
13967-48-1	Ruthenium-106
7440-19-9	Samarium
7319568600	Saturated Hydraulic Conductivity
SC-46	Scandium-46
135-98-8	sec-Butylbenzene
7782-49-2	Selenium
7440-21-3	Silicon
7440-22-4	Silver
AG-110	Silver-110
7440-23-5	Sodium
13966-32-0	Sodium-22
EC	Specific Conductance
79125400	Specific Gravity
SG	Specific Gravity
SR-85	Strontium-85
14158-27-1	Strontium-89
10098-97-2	Strontium-90
100-42-5	Styrene
SO4	Sulfate
18496-25-8	Sulfide
TSS	Suspended Solids
7440-25-7	Tantalum
41903-57-5	TCDD, Total
30402-14-3	TCDF
TC-99	Techetium-99
7440-27-9	Terbium
98904-43-9	Terphenyl-d14
98-06-6	tert-Butylbenzene

Code	Parameter name
877-09-8	Tetrachloro-m-xylene
127-18-4	Tetrachloroethene
479-45-8	Tetryl
7440-28-0	Thallium
14913-50-9	Thallium-208
TH-227	Thorium-227
14274-82-9	Thorium-228
14269-63-7	Thorium-230
7440-29-1	Thorium-232
15065-10-8	Thorium-234
7440-30-4	Thulium
7440-31-5	Tin
SN-113	Tin-113
SN-126	Tin-126
108-88-3	Toluene
2037-26-5	Toluene-d8
AHYD	Total Aromatic Hydrocarbons
TOGRHY	Total C5 TO C11 Petroleum Hydrocarbons
THAHYC	Total Halogenated Hydrocarbons
TOX	Total Organic Halides
RATOT	Total Radium
TSVHYC	Total Semivolatile Hydrocarbons
8001-35-2	Toxaphene
79-01-6	Trichloroethene
75-69-4	Trichlorofluoromethane
10028-17-8	Tritium
7440-61-1	Uranium
UDAUGH	Uranium Daughters
U-233	Uranium-233
13966-29-5	Uranium-234
15117-96-1	Uranium-235
U-235/236	Uranium-235/236
U-236	Uranium-236
24678-82-8	Uranium-238
7440-62-2	Vanadium
108-05-4	Vinyl Acetate
75-01-4	Vinyl Chloride
1330-20-7	Xylenes, Total
7440-64-4	Ytterbium
Y-88	Yttrium-88
7440-66-6	Zinc
ZN-65	Zinc-65
ZR-95	Zirconium-95

3.3.4. Parameter Units

Code	Description
BQ/L	Bequerels per Liter
CM/S	Centimeters/Second
COL/10	Coliform/100 milliliters
CFU/G	Colony Forming Units/Gram
CFU/G	Colony Forming Units/Gram Oven Dried

Code	Description
CFU/ML	Colony Forming Units/Milliliter
CFU/ML	Colony Forming Units/ML
CPM	Counts per Minute
C	Degrees Celsius
F	Degrees Farehneit
DPM/G	Disintegrations per Minute per Gram
G/CC	Grams per Cubic Centimeter
L/MIN	Liters per Minute
UG/G	Micrograms per Gram
UG/KG	Micrograms per Kilogram
UG/L	Micrograms per Liter
UG/ML	Micrograms per Liter
MEQ/100	Milliequivalents/100 Grams
MG/KG	Milligrams per Kilogram
MG/L	Milligrams per Liter
NCI/L	NanoCuries per Liter
NG/G	Nanograms per Gram
NTU	National Thermal Units
%	Percent
STD UN	pH Standard Units
PCI/G	Picocuries per Gram
PCI/L	Picocuries per Liter
PCI/ML	PicoCuries per Milliliter
PG/G	Picograms per Gram
PCF	Pounds per Cubic Foot

3.3.5. Laboratories

Code	Description
DATACH	Data Chem Laboratory
QUANTE	Quanterra Environmental Services
WESTON	Weston Laboratory

MOUND

Environmental
Restoration
Program

Method: Q-013

Electronic Data Deliverable Format Specification - MEIMS Alternate Non-CLP Format - RTL

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: Compendium (November 1996)

1. INTRODUCTION

This procedure contains an alternate specifications for the standard Mound Environmental Information Management System (MEIMS) non-CLP electronic data deliverable (EDD) format. Quality Method Q-012 describes the preferred deliverable format which can be used for non-CLP analyses. The alternative specification should only be used if the laboratory is unable to meet the specifications in Q-012.

2. RESPONSIBILITIES

Laboratory Reporting Staff - The reporting staff is responsible for accurately transferring the laboratory data to 3.5 inch floppy diskettes in the format specified in this procedure.

Database Clerk - The database clerk is responsible for loading the EDD into MEIMS and reporting entry errors to the database administrator.

Database Administrator - The database administrator is responsible for maintaining the format specification in this procedure and resolving laboratory EDD problems. The database administrator may designate an individual to resolve laboratory EDD problems,

3. PROCEDURE

The MEIMS RTL reporting format shall be prepared by Mound contractors in a specified ASCII delimited format whenever the contractor does not utilize MEIMS. The following sections describe the format for each data record for spatial, field measurement, sample, laboratory, chemical and tentatively identified compounds. The definitions for each record type include a field name and description, field type and length, whether it is required, a source of where the information can be found, and finally an example entry for the field.

Valid code lists are provided for fields where codes are used. Examples of each type of data record are also provided.

Sample IDs must be unique for each sampling event. If a new sample is taken from the same station for a project, then a new sample ID must be used.

3.1. MEIMS RTL Record Format

Spatial Information (SPATIAL)

Field Name	Field Type	Field Length	Required	Source	Field Description	Example
OU	C	5		Field log book	Mound Operable Unit	OU1
AREA	C	50	✓	Field log book	Mound general area	Mound Operable Unit 1

Spatial Information (SPATIAL)

Field Name	Field Type	Field Length	Required	Source	Field Description	Example
STATION	C	10	✓	Field log book	Sampling station name	0031
STA_DESC	C	50	✓	Field log book	Sampling station description	33-1
XCOORD	N	13.5	✓	Surveyor	Easting coordinate	1496503.49
YCOORD	N	13.5	✓	Surveyor	Northing coordinate	597967.49
ELEVATION	N	13.5	✓	Surveyor	Elevation	775.28
GRID_SYS	C	5	✓	Surveyor	Coordinate grid system	OH27
GRID_ORENT	C	5		Surveyor	Coordinate grid orientation	
COORDSOURC	C	6	✓	Valid code list	Coordinate source code	SURVEY
STA_TYPE	C	2	✓	Valid code list	Station type code	W

Field Measurement Information (FLD_DATA)

Field Name	Field Type	Field Length	Required	Source	Field Description	Example
STATION	C	10	✓	Field log book	Sampling station name	0031
SMP_ID	C	12		Client ID	Sample ID	0031-0001
DATE_COL	D	8	✓	Field log book	Date of measurement	09/08/94
TIME_COL	C	4		Field log book	Time of measurement	1200
PAR_CODE	C	12	✓	Valid code list	Parameter code	TEMP
RESULTS	C	12	✓	Field log book	Value of measurement	20.0
PAR_UNIT	C	8	✓	Field log book	Units of measurement	C
SMP_EVENT	C	3		Field log book	Sampling event	010
LOG_BOOK	C	3		Field log book	Logbook identification	LB1
PROJ_CODE	C	10	✓	Field log book	Project identification code	MND01

Sampling Information (FLD_SAMP)

Field Name	Field Type	Field Length	Required	Source	Field Description	Example
STATION	C	10	✓	Field log book	Sampling station name	0031
PROJ_CODE	C	10	✓	Field log book	Project identification code	MND01

Sampling Information (FLD_SAMP)						
Field Name	Field Type	Field Length	Required	Source	Field Description	Example
SMP_ID	C	12	✓	Field log book	Sample ID	0031-001
ALT_ID	C	20		Field log book	Alternate sample ID	MND01-0031-0001
COLLECTED	L	1	✓	Field log book	Was the sample collected?	T
DATE_COL	D	8	✓	Field log book	Sample collection date	09/08/94
TIME_COL	C	4		Field log book	Sample collection time	1200
SMP_EVENT	C	3		Field log book	Sampling event	010
FSMP_TYP	C	2	✓	Valid code list	Field sample type	GR
MED_CODE	C	2	✓	Valid code list	Sample media code	0
SSMP_DEP	N	5.1	✓[1]	Field log book	Sample starting interval depth	0.0
ESMP_DEP	N	5.1	✓[1]	Field log book	Sample ending interval depth	2.0
DEP_UNIT	C	2	✓[1]	Field log book	Sample depth unit of measure	FT
LOG_BOOK	C	3		Field log book	Log book identification	LB1
COC	C	5		Chain of custody	Chain of custody identification	32467
S_METHOD	C	2	✓	Valid code list	Sample collection method	AH
COMMENT	C	255		Field log book	Sample collection comments	

[1] Required only for soil samples

Laboratory Information (LAB_SAMP)						
Field Name	Field Type	Field Length	Required	Source	Field Description	Example
ANA_TYPE	C	6	✓	Valid code list	Analysis type code	ORSVO
SMP_ID	C	12	✓	Client ID	Sample ID	0031-0001
LAB_CODE	C	6	✓	Valid code list	Analytic Laboratory code	DATACH
MATRIX	C	10	✓	Laboratory	Lab sample matrix	SOIL
METHOD	C	12	✓	Valid code list	Laboratory analytic method code	CLPSVO
PAR_UNIT	C	8	✓	Valid code list	Laboratory result unit of measure	UG/KG
RES_TYPE	C	3	✓	Valid code list	Analytic result type code	REG
SDG_NUM	C	10		Laboratory	Sample delivery group identifier	SAIS02
FILTERED	L	1	✓	Chain of	Is the sample filtered?	F

Laboratory Information (LAB_SAMP)

Field Name	Field Type	Field Length	Required	Source	Field Description	Example
				custody		
DATE_ANA	D	8	✓	Laboratory	Laboratory sample analysis date	09/30/94
DATE_EXT	D	8		Laboratory	Laboratory sample extraction date	09/14/94
DATE_REC	D	8		Laboratory	Laboratory sample receipt date	09/15/94
DILU_FAC	N	9.3	✓	Laboratory	Laboratory sample dilution factor	1.0
EXT_METH	C	4		Laboratory	Laboratory sample extraction method	
INST_NUM	C	16		Laboratory	Laboratory instrument number	5100-D
LABSMPID	C	15	✓	Laboratory	Laboratory sample ID	CLP10596
LEVEL	C	3		Laboratory	Laboratory analytic level	LOW
PCT_SOL	N	6.2		Laboratory	Laboratory sample percent solids	86.00
SDG_REC	D	8		Client input	Sample delivery group receipt date	10/25/94
SMP_PH	N	4.1		Laboratory	Laboratory sample pH	7.9
TIME_ANA	C	4		Laboratory	Laboratory sample time of analysis	1245
WGT_VOL	N	9.4		Laboratory	Laboratory sample weight or volume	30.0
WV_UNIT	C	2		Laboratory	Laboratory sample weight or volume unit of measure	G

Chemical Information (CHEMICAL)

Field Name	Field Type	Field Length	Required	Source	Field Description	Example
ANA_TYPE	C	6	✓	Valid code list	Analysis type code	ORSVO
SMP_ID	C	12	✓	Client ID	Sample ID	0031-0001
RES_TYPE	C	3	✓	Valid code list	Analytic result type code	REG
METHOD	C	12	✓	Valid code list	Laboratory analytic method code	CLPSVO
PAR_CODE	C	12	✓	Valid code list	Parameter code	108-95-2
RESULTS	C	12	✓	Laboratory	Analytic result	380
ERROR	C	12		Laboratory	Uncertainty or error in analytic result (RADS only)	
DET_LIM	C	12		Laboratory	Detection limit	380
LABQUAL	C	6	✓	Laboratory	Laboratory qualifier	U
DATAQUAL	C	2		Client input	Data validation qualifier	U
VERIFIED	L	1		Client input	Was the analytic result verified?	T
VALIDATED	L	1		Client input	Was the analytic result	T

Chemical Information (CHEMICAL)						
Field Name	Field Type	Field Length	Required	Source	Field Description	Example
					validated?	
VAL_CODE	C	16		Client input	Validation code	See QAAP

Tentatively Identified Compounds (TICS)						
Field Name	Field Type	Field Length	Required	Source	Field Description	Example
ANA_TYPE	C	6	✓	Valid code list	Analysis type code	ORSVO
SMP_ID	C	12	✓	Client ID	Sample ID	0031-0001
RES_TYPE	C	3	✓	Valid code list	Analytic result type code	REG
METHOD	C	12	✓	Valid code list	Laboratory analytic method code	CLPSVO
PAR_CODE	C	12		Valid code list	Parameter code	
RET_TIME	N	5.2		Laboratory	Retention time	37.94
NAME	C	50	✓	Laboratory	Compound name	ALKANE @ C32
RESULTS	C	12	✓	Laboratory	Analytic result	240
LABQUAL	C	6		Laboratory	Laboratory qualifier	J
DATAQUAL	C	2		Valid code list	Data validation qualifier	NJ
VERIFIED	L	1		Client input	Was the analytic result verified?	T
VALIDATED	L	1		Client input	Was the analytic result validated?	T
VAL_CODE	C	16		Client input	Validation code	See QAPP

Laboratory - indicates the information is provided by the contracted laboratory(s).

Client input - indicates that the contractor needs to input this data.

Client ID - indicates the contractor needs to use the client ID developed for the project.

Chain of Custody - indicates the data are found on the sample Chain of Custody form.

Field log book - indicates the information is provided in the contractor's field log book

Surveyor - indicates the information is provided by the contracted surveyor.

Valid Code List - indicates that only codes listed in the valid codes list are to be used. In cases where a code definition does not meet the needs of the data recorded, the data administrator will be contacted so that concurrence can be obtained in establishing required coding conventions. ASCII data files that contain all valid code lists can be provided to all participating contractors. See Section 2.0 for the valid code lists.

3.2. Valid Code Lists

ANA_TYPE	Description
ANION	Common Anions
EPTOX	EP TOX Leachate
GENERA	General Chemistry
GEOTEC	Geotechnical
INORG	Metals
OILGRS	Oil and Grease
ORBTEX	BTEX Compounds
ORDIOX	Dioxins/Dibenzofurans
ORDRO	Diesel Range Organics
OREXP	Explosives
ORGRO	Gasoline Range Organics
ORHERB	Herbicides
ORMORO	Motor Oil Range Organics
ORMRO	Motor Oil Range Organics
ORPETH	Petroleum Hydrocarbons
ORPHNL	Phenols
ORPPB	Pesticides and/or PCBs
ORSVO	Semi-Volatile Organics
ORVOA	Volatile Organics
OTHER	Other
RAD	Radiological
TCLPHB	TCLP Herbicides
TCLPIN	TCLP Metals
TCLPPP	TCLP PCBs
TCLPR	TCLP Reactivity,Corrosivity
TCLPSV	TCLP Semi-Volatiles
TCLPVO	TCLP Volatiles

COORDSOURC	Description
DIGIT	Digitized
SURVEY	Surveyed
GPS	Global postioning system
OTHR	Other
UNK	Unknown

DATAQUAL	Description
	The material was analyzed for and was detected. The associated numerical value is the sample concentration
U	The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit
J	The associated numerical value is an estimated quantity
R	The data are unusable (compound may or may not be present)
NJ	Presumptive evidence of presence of material
J	Presumptive evidence of the presence of the material at an estimated quantity
UJ	The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity

FSMP_TYP	Description
AB	Ambient Blank
BB	Bottle Blank
FB	Field Blank
FR	Other Field
GC	Grab Composite
GR	Grab
OT	Field Duplicate
PC	Flow Composite
PE	Performance Evaluation
RI	Equipment Rinsate
SC	Spatial Composite
SP	Split Sample
TB	Trip Blank
TC	Temporal Composite
WP	Wipe

LAB_CODE	Description
DATACH	Data Chem
QUANTE	Quanterra Environmental Services
WESTON	Weston

MED_CODE	Description
0	Soil
1	Sediment
2	Air
3	Biota
4	Waste Material
5	Surface Water
6	Groundwater
7	Quality Control
8	Other

METHOD	Description
9045	pH
9081	Cation Exchange
ASTM D-425	Density
ASTM D-508	Saturated Hydraulic Conductivity
ASTM D1429	Specific Gravity
ASTM D2974	Organic Content / Moisture
ASTM D422	Hydrometer Analysis / Mechanical Grain Size Analys
ASTMD2460-70	Radium-226
ASTMD2974-87	Organic Carbon
CLP 200.7	Metals by ICP, CLP Method 200.7
CLP 204.2	Antimony by Graphite Furnace, CLP Method 204.2
CLP 206.2	Arsenic by Graphite Furnace, CLP Method 206.2
CLP 210.2	Beryllium by Graphite Furnace, CLP Method 210.2
CLP 213.2	Cadmium by Graphite Furnace, CLP Method 213.2
CLP 218.2	Chromium by Graphite Furnace, CLP Method 218.2
CLP 239.2	Lead by Graphite Furnace, CLP Method 239.2
CLP 245.1	Mercury in water by manual cold vapor
CLP 245.2	Mercury in water by automated cold vapor,CLP 245.2
CLP 245.5	Mercury in Soil by Manual Cold Vapor, CLP Method
CLP 270.2	Selenium by Graphite Furnace, CLP Method 270.2
CLP 272.2	Silver by Graphite Furnace, CLP Method 272.2
CLP 279.2	Thallium by Graphite Furnace, CLP Method 272.2
CLP 335.2	Cyanide by one of the CLP Methods
CLPMET	Metals by CLP Method
CLPPCB	Pesticides/PCBs by GC/ECD, CLP Method 608
CLPSOW	Unknown CLP Method
CLPSVO	Semi-Volatiles by GC/MS, CLP Method 625
CLPVOA	Volatiles by CLP Method
EML AM-01	Americium-241
EPA 160.1	Dissolved Solids
EPA 160.2	Suspended Solids
EPA 200.7	Metals by ICP, Method 200.7
EPA 204.2	Antimony by Graphite Furnace, Method 204.2
EPA 206.2	Arsenic by Graphite Furnace, Method 206.2
EPA 210.2	Beryllium by Graphite Furnace, Method 210.2
EPA 213.2	Cadmium by Graphite Furnace, Method 213.2
EPA 218.2	Chromium by Graphite Furnace, Method 218.2
EPA 239.2	Lead by Graphite Furnace, Method 239.2
EPA 245.1	Mercury in water by manual cold vapor, EPA 245.1
EPA 245.2	Mercury in Water by Auto Cold Vapor, Method 245.2
EPA 245.5	Mercury in Soil by Manual Cold Vapor, Method 245.5
EPA 270.2	Selenium by Graphite Furnace, Method 270.2
EPA 272.2	Silver by Graphite Furnace, Method 272.2
EPA 279.2	Thallium by Graphite Furnace, Method 272.2
EPA 310.1	Alkalinity by Titrimetric (ph 4.5), CAWW Method 310.1
EPA 310.2	Alkalinity
EPA 325.1	Chloride by CAWW Method 325.1
EPA 325.2	Chloride by CAWW Method 325.2
EPA 325.3	Chloride by CAWW Method 325.3

METHOD	Description
EPA 335.2	Cyanide by one of the EPA Methods
EPA 340.2	Fluoride by Potentiometric SIE, CAWW Method 340.2
EPA 350.1	Ammonia
EPA 351.2	Total Nitrogen
EPA 351.3	Nitrogen, CAWW Method
EPA 353.2	Nitrate-Nitrite by CAWW Method 353.2
EPA 354.1	Nitrite by Spectrophometric, CAWW 354.1
EPA 365.1	Total Phosphorous Method EPA 365.1
EPA 365.3	Total Phosphorous Method EPA 365.3
EPA 365.4	Total Phosphorous Method EPA 365.4
EPA 375.2	Sulfate by Turbidimetric, CAWW Method 375.2
EPA 375.4	Sulfate by Turbidimetric, CAWW Method 375.4
EPA 415.1	Total Organic Carbon CAWW Method 415.1
EPA 415.2	Total Organic Carbon CAWW Method 415.2
EPA 418.1	Total Recoverable Petroleum Hydrocarbons, CAWW Method 418.1
EPA 900	Gross Alpha and Gross Beta Radioactivity
EPA 901	Radioactive Method 901
EPA 901.0	Radioactive Method 901.0
EPA 901.1	Radioactive Method 901.1
EPA 903	Alpha-Emitting Radium Isotopes, Method 903
EPA 903.1	EPA 903.1
EPA 905	Radioactive Strontium, Method 905
EPA 905.1	EPA 905.1
EPA 906	Tritium, Method 906
EPA 906.0	Tritium, Method 906.0
EPA 906.1	Tritium, Method 906.1
EPA 907.0	EPA 907.0
EPA 908	Uranium by Radiochemical, Method 908
EPA 908.0	Uranium by Radiochemical, Method 908
ESM430	ESM430
HASL 300	Unknown HASL 300 Method
INSITG	In-situ Gamma Specrometry with portable intrinsic germanium detector
NAS 1960	Thorium Isotopes / Strontium-90
NAS 1962	Uranium Isotopes
NAS 1965	Plutonium Isotopes
NDI 1986	Gamma Spectrometry
NDI1986	Gamma Specrometry
PD8030-1302	Plutonium in Large Soil Samples by an Acid-Leach Anion Exchange Method
PD8030-1343	Plutonium in Small Soil Samples by an Acid-Leach Anion Exchange Method
PD8030-2403	Tritium in Urine
PD8030-3605	Uranium, Thorium Lead-210 in Coal and other Solid Environmental Samples
SW846 8010	Halogenated Volatile Organics., SW846 Method 8010
SW846 8021	Volatile Organics by Purge & Trap GC/PID, SW846 Method 8021
SW846 8030	Acrolein, Acrylonitrile, Acetonitrile
SW846 8080	Organochlorine Pesticides/PCBs, SW846 Method 8080
SW846 8120	Chlorinated Hydrocarbons, SW846 Method 8120
SW846 8240	Volatiles by GC/MS, SW846 Method 8240
SW846 8270	Semi-Volatiles by GC/MS Capillary Column, SW846 Method 8270
SW846 8280	Polychlorinated Dibenzo-p-Dioxins/Dibenzofurans

METHOD	Description
SW846 8290	SW846 8290
SW846 8330	Explosives
SW846 8460	SW846 8460
SW846 9036	Sulfate by Colorimetric Automated Methyl Thymol Blue AA II, SW846 Method 9036
SW846 9045	SW846 9045
SW846 9081	SW846 9081
SW846 9250	Chloride by SW846 Method 9250
TDMS	Total Aromatics
UNKNOWN	Unknown method

PAR_CODE	Parameter name	Database table
100	% Clay	CHEMICAL
54100	% Gravel	CHEMICAL
8000	% Sand	CHEMICAL
8400	% Silt	CHEMICAL
630-20-6	1,1,1,2-Tetrachloroethane	CHEMICAL
71-55-6	1,1,1-Trichloroethane	CHEMICAL
79-34-5	1,1,2,2-Tetrachloroethane	CHEMICAL
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	CHEMICAL
79-00-5	1,1;2-Trichloroethane	CHEMICAL
75-34-3	1,1-Dichloroethane	CHEMICAL
75-35-4	1,1-Dichloroethene	CHEMICAL
563-58-6	1,1-Dichloropropene	CHEMICAL
35822-46-9	1,2,3,4,6,7,8-HpCDD	CHEMICAL
67562-39-4	1,2,3,4,6,7,8-HpCDF	CHEMICAL
55673-89-7	1,2,3,4,7,8,9-HpCDF	CHEMICAL
39227-28-6	1,2,3,4,7,8-HxCDD	CHEMICAL
70648-26-9	1,2,3,4,7,8-HxCDF	CHEMICAL
57653-85-7	1,2,3,6,7,8-HxCDD	CHEMICAL
57117-44-9	1,2,3,6,7,8-HxCDF	CHEMICAL
19408-74-3	1,2,3,7,8,9-HxCDD	CHEMICAL
72918-21-9	1,2,3,7,8,9-HxCDF	CHEMICAL
40321-76-4	1,2,3,7,8-PeCDD	CHEMICAL
57117-41-6	1,2,3,7,8-PeCDF	CHEMICAL
87-61-6	1,2,3-Trichlorobenzene	CHEMICAL
96-18-4	1,2,3-Trichloropropane	CHEMICAL
120-82-1	1,2,4-Trichlorobenzene	CHEMICAL
95-63-6	1,2,4-Trimethylbenzene	CHEMICAL
156-59-2	1,2-cis-Dichloroethene	CHEMICAL
96-12-8	1,2-Dibromo-3-chloropropane	CHEMICAL
106-93-4	1,2-Dibromoethane	CHEMICAL
95-50-1	1,2-Dichlorobenzene	CHEMICAL
107-06-2	1,2-Dichloroethane	CHEMICAL
540-59-0	1,2-Dichloroethene	CHEMICAL
78-87-5	1,2-Dichloropropane	CHEMICAL
135-01-3	1,2-Diethylbenzene	CHEMICAL
156-60-5	1,2-trans-Dichloroethene	CHEMICAL
108-67-8	1,3,5-Trimethylbenzene	CHEMICAL

PAR_CODE	Parameter name	Database table
99-35-4	1,3,5-Trinitrobenzene	CHEMICAL
10061-01-5	1,3-cis-Dichloropropene	CHEMICAL
541-73-1	1,3-Dichlorobenzene	CHEMICAL
142-28-9	1,3-Dichloropropane	CHEMICAL
141-93-5	1,3-Diethylbenzene	CHEMICAL
99-65-0	1,3-Dinitrobenzene	CHEMICAL
10061-02-6	1,3-trans-Dichloropropene	CHEMICAL
106-46-7	1,4-Dichlorobenzene	CHEMICAL
105-05-5	1,4-Diethylbenzene	CHEMICAL
544-10-5	1-Chlorohexane	CHEMICAL
108-60-1	2,2'-oxybis(1-chloropropane)	CHEMICAL
594-20-7	2,2-Dichloropropane	CHEMICAL
60851-34-5	2,3,4,6,7,8-HxCDF	CHEMICAL
57117-31-4	2,3,4,7,8-PeCDF	CHEMICAL
1746-01-6	2,3,7,8-TCDD	CHEMICAL
51207-31-9	2,3,7,8-TCDF	CHEMICAL
95-95-4	2,4,5-Trichlorophenol	CHEMICAL
88-06-2	2,4,6-Trichlorophenol	CHEMICAL
118-96-7	2,4,6-Trinitrotoluene	CHEMICAL
120-83-2	2,4-Dichlorophenol	CHEMICAL
105-67-9	2,4-Dimethylphenol	CHEMICAL
51-28-5	2,4-Dinitrophenol	CHEMICAL
121-14-2	2,4-Dinitrotoluene	CHEMICAL
606-20-2	2,6-Dinitrotoluene	CHEMICAL
35572-78-2	2-Amino-4,6-dinitrotoluene	CHEMICAL
120-32-1	2-Benzyl-4-Chlorophenol	CHEMICAL
78-93-3	2-Butanone	CHEMICAL
110-75-8	2-Chloroethylvinylether	CHEMICAL
91-58-7	2-Chloronaphthalene	CHEMICAL
95-57-8	2-Chlorophenol	CHEMICAL
95-49-8	2-Chlorotoluene	CHEMICAL
591-78-6	2-Hexanone	CHEMICAL
91-57-6	2-Methylnaphthalene	CHEMICAL
95-48-7	2-Methylphenol	CHEMICAL
88-74-4	2-Nitroaniline	CHEMICAL
88-75-5	2-Nitrophenol	CHEMICAL
88-72-2	2-Nitrotoluene	CHEMICAL
91-94-1	3,3'-Dichlorobenzidine	CHEMICAL
618-87-1	3,5-Dinitroaniline	CHEMICAL
99-09-2	3-Nitroaniline	CHEMICAL
99-08-1	3-Nitrotoluene	CHEMICAL
72-54-8	4,4'-DDD	CHEMICAL
72-55-9	4,4'-DDE	CHEMICAL
50-29-3	4,4'-DDT	CHEMICAL
534-52-1	4,6-Dinitro-o-Cresol	CHEMICAL
1946-51-0	4-Amino-2,6-Dinitrotoluene	CHEMICAL
101-55-3	4-Bromophenyl-phenyl Ether	CHEMICAL
59-50-7	4-chloro-3-methylphenol	CHEMICAL
106-47-8	4-Chloroaniline	CHEMICAL

PAR_CODE	Parameter name	Database table
7005-72-3	4-Chlorophenyl-phenylether	CHEMICAL
106-43-4	4-Chlorotoluene	CHEMICAL
108-10-1	4-Methyl-2-pentanone	CHEMICAL
106-44-5	4-Methylphenol	CHEMICAL
100-01-6	4-Nitroaniline	CHEMICAL
100-02-7	4-Nitrophenol	CHEMICAL
99-99-0	4-Nitrotoluene	CHEMICAL
83-32-9	Acenaphthene	CHEMICAL
208-96-8	Acenaphthylene	CHEMICAL
67-64-1	Acetone	CHEMICAL
75-05-8	Acetonitrile	CHEMICAL
107-13-1	Acrylonitrile	CHEMICAL
AC-227	Actinium-227	CHEMICAL
14331-83-0	Actinium-228	CHEMICAL
309-00-2	Aldrin	CHEMICAL
ALK	Alkalinity	CHEMICAL
ALHCO3	Alkalinity: HCO3	CHEMICAL
5103-71-9	Alpha Chlordane	CHEMICAL
ALPHA	Alpha, Total	CHEMICAL
319-84-6	Alpha-BHC	CHEMICAL
7429-90-5	Aluminum	CHEMICAL
14596-10-2	Americium-241	CHEMICAL
AMM	Ammonia	CHEMICAL
120-12-7	Anthracene	CHEMICAL
7440-36-0	Antimony	CHEMICAL
SB-124	Antimony-124	CHEMICAL
SB-125	Antimony-125	CHEMICAL
12674-11-2	Aroclor-1016	CHEMICAL
11104-28-2	Aroclor-1221	CHEMICAL
11141-16-5	Aroclor-1232	CHEMICAL
53469-21-9	Aroclor-1242	CHEMICAL
12672-29-6	Aroclor-1248	CHEMICAL
11097-69-1	Aroclor-1254	CHEMICAL
11096-82-5	Aroclor-1260	CHEMICAL
7440-38-2	Arsenic	CHEMICAL
7440-39-3	Barium	CHEMICAL
BA-133	Barium-133	CHEMICAL
BA-140	Barium-140	CHEMICAL
71-43-2	Benzene	CHEMICAL
92-87-5	Benzidine	CHEMICAL
56-55-3	Benzo(a)anthracene	CHEMICAL
50-32-8	Benzo(a)pyrene	CHEMICAL
205-99-2	Benzo(b)fluoranthene	CHEMICAL
191-24-2	Benzo(g,h,i)perylene	CHEMICAL
207-08-9	Benzo(k)fluoranthene	CHEMICAL
65-85-0	Benzoic Acid	CHEMICAL
100-51-6	Benzyl Alcohol	CHEMICAL
7440-41-7	Beryllium	CHEMICAL
13966-02-4	Beryllium-7	CHEMICAL

PAR_CODE	Parameter name	Database table
BETA	Beta, Total	CHEMICAL
319-85-7	Beta-BHC	CHEMICAL
BOD	Bio Oxygen Demand	CHEMICAL
111-91-1	Bis(2-chloroethoxy)methane	CHEMICAL
111-44-4	Bis(2-chloroethyl)ether	CHEMICAL
117-81-7	Bis(2-ethylhexyl)phthalate	CHEMICAL
7440-69-9	Bismuth	CHEMICAL
BI-207	Bismuth-207	CHEMICAL
BI-210	Bismuth-210	CHEMICAL
BI-210M	Bismuth-210M	CHEMICAL
BI-211	Bismuth-211	CHEMICAL
14913-49-6	Bismuth-212	CHEMICAL
14733-03-0	Bismuth-214	CHEMICAL
7440-42-8	Boron	CHEMICAL
108-86-1	Bromobenzene	CHEMICAL
74-97-5	Bromochloromethane	CHEMICAL
75-27-4	Bromodichloromethane	CHEMICAL
75-25-2	Bromoform	CHEMICAL
74-83-9	Bromomethane	CHEMICAL
85-68-7	Butyl Benzyl Phthalate	CHEMICAL
C4C8	C4-C8 Cycloalkanes/Alkenes	CHEMICAL
7440-43-9	Cadmium	CHEMICAL
7440-70-2	Calcium	CHEMICAL
86-74-8	Carbazole	CHEMICAL
75-15-0	Carbon Disulfide	CHEMICAL
56-23-5	Carbon Tetrachloride	CHEMICAL
153861900	Cation Exchange	CHEMICAL
CEC	Cation Exchange Capacity as Na	CHEMICAL
CERADA	Ceridaphnia	CHEMICAL
7440-45-1	Cerium	CHEMICAL
CE-139	Cerium-139	CHEMICAL
CE-141	Cerium-141	CHEMICAL
CE-144	Cerium-144	CHEMICAL
13967-70-9	Cesium-134	CHEMICAL
10045-97-3	Cesium-137	CHEMICAL
COD	Chemical Oxygen Demand	CHEMICAL
57-74-9	Chlordane	CHEMICAL
CL	Chloride	CHEMICAL
7782-50-5	Chlorine	CHEMICAL
108-90-7	Chlorobenzene	CHEMICAL
75-00-3	Chloroethane	CHEMICAL
67-66-3	Chloroform	CHEMICAL
74-87-3	Chloromethane	CHEMICAL
25168-05-2	Chlorotoluene	CHEMICAL
7440-47-3	Chromium	CHEMICAL
CR6	Chromium, Hexavalent	CHEMICAL
CR-51	Chromium-51	CHEMICAL
218-01-9	Chrysene	CHEMICAL
7440-48-4	Cobalt	CHEMICAL

PAR_CODE	Parameter name	Database table
CO-57	Cobalt-57	CHEMICAL
CO-58	Cobalt-58	CHEMICAL
10198-40-0	Cobalt-60	CHEMICAL
7440-50-8	Copper	CHEMICAL
57-12-5	Cyanide	CHEMICAL
319-86-8	Delta-BHC	CHEMICAL
84-74-2	Di-n-butyl Phthalate	CHEMICAL
117-84-0	Di-n-octyl Phthalate	CHEMICAL
53-70-3	Dibenzo(a,h)anthracene	CHEMICAL
132-64-9	Dibenzofuran	CHEMICAL
124-48-1	Dibromochloromethane	CHEMICAL
74-95-3	Dibromomethane	CHEMICAL
75-71-8	Dichlorodifluoromethane	CHEMICAL
60-57-1	Dieldrin	CHEMICAL
DRO	Diesel Range Organics	CHEMICAL
84-66-2	Diethyl Phthalate	CHEMICAL
131-11-3	Dimethyl Phthalate	CHEMICAL
DO	Dissolved Oxygen	CHEMICAL
TDS	Dissolved Solids	CHEMICAL
7429-91-6	Dypsprosium	CHEMICAL
ECOLI	E. Coli	CHEMICAL
959-98-8	Endosulfan I	CHEMICAL
33213-65-9	Endosulfan II	CHEMICAL
1031-07-8	Endosulfan Sulfate	CHEMICAL
72-20-8	Endrin	CHEMICAL
7421-93-4	Endrin Aldehyde	CHEMICAL
53494-70-5	Endrin Ketone	CHEMICAL
7440-52-0	Erbium	CHEMICAL
100-41-4	Ethylbenzene	CHEMICAL
7440-53-1	Europium	CHEMICAL
14683-23-9	Europium-152	CHEMICAL
15585-10-1	Europium-154	CHEMICAL
EU-155	Europium-155	CHEMICAL
FECAL	Fecal Coliform Bac	CHEMICAL
206-44-0	Fluoranthene	CHEMICAL
86-73-7	Fluorene	CHEMICAL
FL	Fluoride	CHEMICAL
462-06-6	Flurobenzene	CHEMICAL
7440-54-2	Gadolinium	CHEMICAL
GD-153	Gadolinium-153	CHEMICAL
5103-74-2	Gamma Chlordane	CHEMICAL
58-89-9	Gamma-BHC (Lindane)	CHEMICAL
GRO	Gasoline Range Organics	CHEMICAL
HARDCA	Hardness as CaCO3	CHEMICAL
76-44-8	Heptachlor	CHEMICAL
1024-57-3	Heptachlor Epoxide	CHEMICAL
118-74-1	Hexachlorobenzene	CHEMICAL
87-68-3	Hexachlorobutadiene	CHEMICAL
77-47-4	Hexachlorocyclopentadiene	CHEMICAL

PAR_CODE	Parameter name	Database table
67-72-1	Hexachloroethane	CHEMICAL
110-54-3	Hexane	CHEMICAL
2691-41-0	HMX	CHEMICAL
7440-60-0	Holmium	CHEMICAL
37871-00-4	HpCDD	CHEMICAL
38998-75-3	HpCDF	CHEMICAL
34465-46-8	HxCDD	CHEMICAL
55684-94-1	HxCDF	CHEMICAL
193-39-5	Indeno(1,2,3-cd)pyrene	CHEMICAL
IOD	Iodide	CHEMICAL
I-131	Iodine-131	CHEMICAL
74-88-4	Iodomethane	CHEMICAL
IR-192	Iridium-192	CHEMICAL
7439-89-6	Iron	CHEMICAL
FE-59	Iron-59	CHEMICAL
78-59-1	Isophorone	CHEMICAL
98-82-8	Isopropyl Benzene	CHEMICAL
7439-91-0	Lanthanum	CHEMICAL
LA-140	Lanthanum-140	CHEMICAL
7439-92-1	Lead	CHEMICAL
PB-210	Lead-210	CHEMICAL
15092-94-1	Lead-212	CHEMICAL
15067-28-4	Lead-214	CHEMICAL
7439-93-2	Lithium	CHEMICAL
7439-94-3	Lutetium	CHEMICAL
13777-61-2	m&p-Xylene	CHEMICAL
7439-95-4	Magnesium	CHEMICAL
7439-96-5	Manganese	CHEMICAL
MN-54	Manganese-54	CHEMICAL
5711900	Maximum Density	CHEMICAL
571582400	Maximum Dry Density	CHEMICAL
7439-97-6	Mercury	CHEMICAL
HG-203	Mercury-203	CHEMICAL
72-43-5	Methoxychlor	CHEMICAL
75-09-2	Methylene Chloride	CHEMICAL
717423200	Minimum Dry Density	CHEMICAL
3711900	Minimum Density	CHEMICAL
45800	Moisture	CHEMICAL
7439-98-7	Molybdenum	CHEMICAL
MORO	Motor Oil Range Organics	CHEMICAL
104-51-8	n-Butylbenzene	CHEMICAL
621-64-7	N-Nitroso-di-n-propylamine	CHEMICAL
86-30-6	N-Nitrosodiphenylamine	CHEMICAL
103-65-1	n-propylbenzene	CHEMICAL
91-20-3	Naphthalene	CHEMICAL
7440-00-8	Neodymium	CHEMICAL
NP-237	Neptunium-237	CHEMICAL
7440-02-0	Nickel	CHEMICAL
NB-95	Niobium-95	CHEMICAL

PAR_CODE	Parameter name	Database table
NO3	Nitrate	CHEMICAL
NO2/NO3	Nitrate-Nitrite-N	CHEMICAL
1497-55-8	Nitrate/Nitrite	CHEMICAL
NO2	Nitrite	CHEMICAL
98-95-3	Nitrobenzene	CHEMICAL
NITROGEN	Nitrogen	CHEMICAL
55-63-0	Nitroglycerin	CHEMICAL
348-51-6	O-Chloroflurobenzene	CHEMICAL
95-47-6	o-Xylene	CHEMICAL
3268-87-9	OCDD	CHEMICAL
39001-02-0	OCDF	CHEMICAL
OIL	Oil	CHEMICAL
OMC	Optimum Moisture Content	CHEMICAL
TOC	Organic Carbon	CHEMICAL
7683200	Organic Content	CHEMICAL
MOIST	Organic Content / Moisture	CHEMICAL
99-87-6	p-Isopropyltoluene	CHEMICAL
36088-22-9	PeCDDl	CHEMICAL
30402-15-4	PeCDF	CHEMICAL
87-86-5	Pentachlorophenol	CHEMICAL
%MOISTURE	Percent Moisture	CHEMICAL
%SOLIDS	Percent Solids	CHEMICAL
PERM	Permeability	CHEMICAL
78-11-5	PETN	CHEMICAL
1006	pH	CHEMICAL
85-01-8	Phenanthrene	CHEMICAL
108-95-2	Phenol	CHEMICAL
PHENOLICS	Phenolics	CHEMICAL
PHENOLS	Phenols	CHEMICAL
PO4T	Phosphate	CHEMICAL
PHOS	Phosphorous	CHEMICAL
7723-14-0	Phosphorous	CHEMICAL
PIMEP	Pimephales	CHEMICAL
PU-238/239	Plutonium 238/239	CHEMICAL
13981-16-3	Plutonium-238	CHEMICAL
PU-239/240	Plutonium-239/240	CHEMICAL
PU-242	Plutonium-242	CHEMICAL
PO-210	Polonium-210	CHEMICAL
1336-36-3	Polychlorinated Biphenyl (PCB)	CHEMICAL
7440-09-7	Potassium	CHEMICAL
13966-00-2	Potassium-40	CHEMICAL
7440-10-0	Praseodym	CHEMICAL
13981-14-1	Protactinium-233	CHEMICAL
15100-28-4	Protactinium-234 metastable	CHEMICAL
15117-48-3	Pu-239	CHEMICAL
129-00-0	Pyrene	CHEMICAL
15623-45-7	Radium-223	CHEMICAL
13233-32-4	Radium-224	CHEMICAL
RA-225	Radium-225	CHEMICAL

PAR_CODE	Parameter name	Database table
13982-63-3	Radium-226	CHEMICAL
RA-228	Radium-228	CHEMICAL
121-82-4	RDX	CHEMICAL
EH	Redox Potential	CHEMICAL
RU-103	Ruthenium-103	CHEMICAL
13967-48-1	Ruthenium-106	CHEMICAL
7440-19-9	Samarium	CHEMICAL
7319568600	Saturated Hydraulic Conductivity	CHEMICAL
SC-46	Scandium-46	CHEMICAL
135-98-8	sec-Butylbenzene	CHEMICAL
7782-49-2	Selenium	CHEMICAL
7440-21-3	Silicon	CHEMICAL
7440-22-4	Silver	CHEMICAL
AG-110	Silver-110	CHEMICAL
7440-23-5	Sodium	CHEMICAL
13966-32-0	Sodium-22	CHEMICAL
EC	Specific Conductance	CHEMICAL
79125400	Specific Gravity	CHEMICAL
SG	Specific Gravity	CHEMICAL
SR-85	Strontium-85	CHEMICAL
14158-27-1	Strontium-89	CHEMICAL
10098-97-2	Strontium-90	CHEMICAL
100-42-5	Styrene	CHEMICAL
SO4	Sulfate	CHEMICAL
18496-25-8	Sulfide	CHEMICAL
TSS	Suspended Solids	CHEMICAL
7440-25-7	Tantalum	CHEMICAL
41903-57-5	TCDD, Total	CHEMICAL
30402-14-3	TCDF	CHEMICAL
TC-99	Techetium-99	CHEMICAL
7440-27-9	Terbium	CHEMICAL
98-06-6	tert-Butylbenzene	CHEMICAL
127-18-4	Tetrachloroethene	CHEMICAL
479-45-8	Tetryl	CHEMICAL
7440-28-0	Thallium	CHEMICAL
14913-50-9	Thallium-208	CHEMICAL
TH-227	Thorium-227	CHEMICAL
14274-82-9	Thorium-228	CHEMICAL
14269-63-7	Thorium-230	CHEMICAL
7440-29-1	Thorium-232	CHEMICAL
15065-10-8	Thorium-234	CHEMICAL
7440-30-4	Thulium	CHEMICAL
7440-31-5	Tin	CHEMICAL
SN-113	Tin-113	CHEMICAL
SN-126	Tin-126	CHEMICAL
108-88-3	Toluene	CHEMICAL
AHYD	Total Aromatic Hydrocarbons	CHEMICAL
TOGRHY	Total C5 TO C11 Petrolium Hydrocarbons	CHEMICAL
THAHYC	Total Halogenated Hydrocarbons	CHEMICAL

PAR_CODE	Parameter name	Database table
TOX	Total Organic Halides	CHEMICAL
RATOT	Total Radium	CHEMICAL
TSVHYC	Total Semivolatile Hydrocarbons	CHEMICAL
8001-35-2	Toxaphene	CHEMICAL
79-01-6	Trichloroethene	CHEMICAL
75-69-4	Trichlorofluoromethane	CHEMICAL
10028-17-8	Tritium	CHEMICAL
7440-61-1	Uranium	CHEMICAL
UDAUGH	Uranium Daughters	CHEMICAL
U-233	Uranium-233	CHEMICAL
13966-29-5	Uranium-234	CHEMICAL
15117-96-1	Uranium-235	CHEMICAL
U-235/236	Uranium-235/236	CHEMICAL
U-236	Uranium-236	CHEMICAL
24678-82-8	Uranium-238	CHEMICAL
7440-62-2	Vanadium	CHEMICAL
108-05-4	Vinyl Acetate	CHEMICAL
75-01-4	Vinyl Chloride	CHEMICAL
1330-20-7	Xylenes, Total	CHEMICAL
7440-64-4	Ytterbium	CHEMICAL
Y-88	Yttrium-88	CHEMICAL
7440-66-6	Zinc	CHEMICAL
ZN-65	Zinc-65	CHEMICAL
ZR-95	Zirconium-95	CHEMICAL
ALK	Alkalinity	FIELD_DATA
COND	Conductivity	FIELD_DATA
CCCH1	Contamination Criteria Channel 1	FIELD_DATA
CCCH2	Contamination Criteria Channel 2	FIELD_DATA
CCCOC	Contamination Criteria Out Channel	FIELD_DATA
DO	Dissolved Oxygen	FIELD_DATA
FIDCH1	Fidler Channel 1	FIELD_DATA
FIDCH2	Fidler Channel 2	FIELD_DATA
FIDOC	Fidler Out Channel	FIELD_DATA
WFLO	Flow	FIELD_DATA
PH	Potential of Hydrogen	FIELD_DATA
EH	Redox Potential	FIELD_DATA
EC	Specific Conductance	FIELD_DATA
TEMP	Temperature	FIELD_DATA
TURB	Turbidity	FIELD_DATA
WLEVEL	Water Level	FIELD_DATA

PAR_UNIT	Description	Database table
BQ/L	Bequerels per Liter	LAB_SAMP
DPM/G	Disintegrations per Minute per Gram	LAB_SAMP
MG/KG	Milligrams per Kilogram	LAB_SAMP
MG/L	Milligrams per Liter	LAB_SAMP
NCI/L	NanoCuries per Liter	LAB_SAMP
NG/G	Nanograms per Gram	LAB_SAMP

PAR_UNIT	Description	Database table
PCI/G	Picocuries per Gram	LAB_SAMP
PCI/L	Picocuries per Liter	LAB_SAMP
PCI/ML	PicoCuries per Milliliter	LAB_SAMP
PG/G	Picograms per Gram	LAB_SAMP
UG/G	Micrograms per Gram	LAB_SAMP
UG/KG	Micrograms per Kilogram	LAB_SAMP
UG/L	Micrograms per Liter	LAB_SAMP
UG/ML	Micrograms per Liter	LAB_SAMP
%	Percent	FLD_DATA
C	Degrees Celsius	FLD_DATA
CFU/G	Colony Forming Units/Gram	FLD_DATA
CFU/G	Colony Forming Units/Gram Oven Drie	FLD_DATA
CFU/ML	Colony Forming Units/Milliliter	FLD_DATA
CFU/ML	Colony Forming Units/ML	FLD_DATA
CM/S	Centimeters/Second	FLD_DATA
COL/10	Coliform/100 milliliters	FLD_DATA
CPM	Counts per Minute	FLD_DATA
F	Degrees Farehneit	FLD_DATA
G/CC	Grams per Cubic Centimeter	FLD_DATA
L/MIN	Liters per Minute	FLD_DATA
MEQ/100	Milliequivalents/100 Grams	FLD_DATA
NTU	National Thermal Units	FLD_DATA
PCF	Pounds per Cubic Foot	FLD_DATA
STD UN	pH Standard Units	FLD_DATA

RES_TYPE	Description
DIL	Result from a dilution analysis
FLD	Result from a field analysis
REA	Result from a reanalysis
REG	Result from a normal analysis
REO	Result before a reanalysis
SCR	Result from a screening analysis

S_METHOD	Description
	Unknown
AC	Auger, continuous flight
AH	Auger, hand
AO	Auger, hollow stem
AP	Pump, air lift
B	Bailer
CN	Air canister
CS	Clam shell
DP	Dipper
KS	Kemmerer Sampler
NA	Not Applicable
PC	Pump, centrifugal
PI	Pump, piston

S_METHOD	Description
PL	Pump, suction lift
PP	Pump, peristaltic
PS	Pump, submersible
SC	Scoop
SS	Split spoon
SV	Shovel
TR	Trowel
W	Swab or Wipe

STA_TYPE	Description
W	Well
BH	Borehole
NA	Not Applicable
SL	Surface location
OT	Other

3.3. Example RTL EDD Format

Example of SPATIAL.CSV format:

```
"OU4","Miami-Erie Canal","XXX","XXX CANAL
    POINT",1463628.58900,594510.70770,694.50000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","W","W CANAL POINT",1463716.19730,595029.06630,691.20000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","YS","YS CANAL POINT",1463884.72550,595821.19190,693.40000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","YYS1","YYS1 WEST BANK LOW
    POINT",1463982.99500,596328.21550,691.90000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","YYS2","YYS2 WEST BANK HIGH
    POINT",1464008.53230,596317.84430,699.50000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","YYS3","YYS3 WEST CANAL
    POINT",1464033.33360,596308.39740,694.50000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","YYS4","YYS4 EAST CANAL
    POINT",1464042.89950,596311.84160,695.90000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","YYS5","YYS5 EAST BANK HIGH
    POINT",1464054.75130,596304.82690,701.20000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","YYS6","YYS6 EAST BANK LOW
    POINT",1464064.46470,596301.36540,700.40000,"OH83","","SURVEY","BH"
"OU4","Miami-Erie Canal","YQ1","YQ1 WEST BANK LOW
    POINT",1464201.94930,596986.45170,696.40000,"OH83","","SURVEY","BH"
```

Example of FLD_DATA.CSV format:

```
"MND21-2305","900000050",19940919,"1100","DO","10.4","MG/L","1","","SWSD"
"MND21-2305","900000050",19940919,"1100","PH","9.08","SU","1","","SWSD"
"MND21-2305","900000050",19940919,"1100","EC","1.10","UMHOS","1","","SWSD"
"MND21-2305","900000050",19940919,"1100","TEMP","21.0","C","1","","SWSD"
"MND21-2305","900000050",19940919,"1100","ALK","34.0","MG/L","1","","SWSD"
"MND21-2305","900000050",19940919,"1100","EH","147","MVOLTS","1","","SWSD"
"MND21-2305","900000051",19940919,"1100","EH","147","MVOLTS","1","","SWSD"
"MND21-2305","900000051",19940919,"1100","EC","1.10","UMHOS","1","","SWSD"
"MND21-2305","900000051",19940919,"1100","TEMP","21.0","C","1","","SWSD"
"MND21-2305","900000051",19940919,"1100","PH","9.08","SU","1","","SWSD"
```

Example of FLD_SAMP.CSV format:

```
"XXX","MND40","012001","MND40-2001-0001",T,19920727,"1057","","GR","0",0.0,1.0,"FT","","","SS",""
"XXX","MND40","012002","MND40-2001-0002",T,19920727,"1111","","GR","0",1.0,2.0,"FT","","","SS",""
"XXX","MND40","012003","MND40-2001-0003",T,19920727,"1145","","GR","0",2.0,3.0,"FT","","","SS",""
"YS","MND40","022001","MND40-2002-0001",T,19920728,"848","","GR","0",0.0,1.0,"FT","","","SS",""
"YS","MND40","022002","MND40-2002-0002",T,19920728,"907","","GR","0",1.0,2.0,"FT","","","SS",""
"YS","MND40","022003","MND40-2002-0003",T,19920728,"926","","GR","0",2.0,3.0,"FT","","","SS",""
"YS","MND40","022004","MND40-2002-0004",T,19920728,"950","","GR","0",3.0,4.0,"FT","","","SS",""
"YS","MND40","022005","MND40-2002-0005",T,19920728,"1013","","GR","0",4.0,5.0,"FT","","","SS",""
"YYS1","MND40","MC0032001","MND40-2003-0001",T,19920721,"1605","","GR","0",0.0,1.0,"FT","","","SS",""
"YYS1","MND40","MC0032002","MND40-2003-0002",T,19920721,"1625","","GR","0",1.0,2.0,"FT","","","SS",""
```

Example of LAB_SAMP.CSV format:

```
"INORG","012001","DATACH","SOIL","UNKNOWN","MG/KG","REG","SAIM02",,          ,
,19920728,0.000,"","","CLP105","LOW",87.00,          ,0.0,"0",0.0000,""
"ORSVO","012002","DATACH","SOIL","CLPSVO","UG/KG","REG","SAIS02",,19920823,19920731,19920728,1.000,"","5100-
D","CLP10594","LOW",85.00,          ,7.6,"1607",30.0000,"G"
"ORPPB","012003","DATACH","SOIL","CLPPCB","UG/KG","REG","SAIP02",,19920814,19920731,19920728,1.000,"SONC",""
,"CLP-10594","NA",85.00,          ,7.6,"0",30.0000,"G"
"INORG","022001","DATACH","SOIL","CLPMET","MG/KG","REG","SAIM02",,19920804,          ,19920728,1.000,"","TAA-
II-C","CLP105","LOW",87.00,          ,0.0,"1833",0.0000,""
"INORG","022002","DATACH","SOIL","CLPMET","MG/KG","REG","SAIM02",,          ,
,19920728,0.000,"","","CLP105","LOW",87.00,          ,0.0,"0",0.0000,""
"INORG","022003","DATACH","SOIL","CLPMET","MG/KG","REG","SAIM02",,          ,
,19920728;0.000,"","","CLP105","LOW",87.00,          ,0.0,"0",0.0000,""
"INORG","022004","DATACH","SOIL","CLPMET","MG/KG","REG","SAIM02",,19920813,          ,19920728,1.000,"","AAS-
CVC","CLP105","LOW",87.00,          ,0.0,"1522",0.0000,""
"INORG","022005","DATACH","SOIL","CLPMET","MG/KG","REG","SAIM02",,          ,
,19920728,0.000,"","","CLP105","LOW",87.00,          ,0.0,"0",0.0000,""
"INORG","MC0032001","DATACH","SOIL","CLPMET","MG/KG","REG","SAIM02",,          ,
,19920728,0.000,"","","CLP105","LOW",87.00,          ,0.0,"0",0.0000,""
"ORVOA","MC0032002","DATACH","SOIL","CLPVOA","UG/KG","REG","SAIV02",,19920803,
,19920728,1.000,"","5100-E","CLP10594","LOW",85.00,          ,0.0,"1449",5.0000,"G"
"RAD","MC0032003","PACE","SOIL","EPA 906","PCI/G","REG","D20729501",,19920910,          ,
,0.000,"","LSC1","65-0126714","NA",86.30,          ,0.0,"0",107.8000,"G"
"RAD","MC0042001","PACE","SOIL","EERF-00-07","PCI/G","REG","D20729501",,19921006,          ,
,0.000,"","ASD5","65-0126714","NA",86.30,          ,0.0,"0",1.0000,"G"
"RAD","MC0042002","PACE","SOIL","EERF-00-07","PCI/G","REG","D20729501",,19921006,          ,
,0.000,"","ASD5","65-0126714","NA",86.30,          ,0.0,"0",1.0000,"G"
"RAD","MC0042003","PACE","SOIL","EERF-00-07","PCI/G","REG","D20729501",,19921006,          ,
,0.000,"","ASD5","65-0126714","NA",86.30,          ,0.0,"0",1.0000,"G"
"RAD","MC0042004","PACE","SOIL","EPA 908","PCI/G","REG","D20729501",,19921013,          ,
,0.000,"","ASD2","65-0126714","NA",86.30,          ,0.0,"0",0.5000,"G"
"RAD","MC0042005","PACE","SOIL","EPA 908","PCI/G","REG","D20729501",,19921013,          ,
,0.000,"","ASD2","65-0126714","NA",86.30,          ,0.0,"0",0.5000,"G"
"RAD","052001","PACE","SOIL","EPA 908","PCI/G","REG","D20729501",,19921013,          ,
,0.000,"","ASD2","65-0126714","NA",86.30,          ,0.0,"0",0.5000,"G"
"RAD","052002","PACE","SOIL","E-PU-06","PCI/G","REG","D20729501",,19920923,          ,
,0.000,"","ASD2","65-0126714","NA",86.30,          ,0.0,"0",1.0000,"G"
"RAD","052003","PACE","SOIL","E-PU-06","PCI/G","REG","D20729501",,19920923,          ,
,0.000,"","ASD2","65-0126714","NA",86.30,          ,0.0,"0",1.0000,"G"
"RAD","062001","PACE","SOIL","EPA 901","PCI/G","REG","D20729501",,19920917,          ,          ,0.000,"","GS
1","65-0126714","NA",86.30,          ,0.0,"0",77.3000,"G"
```

Example of CHEMICAL.CSV format:

```
"INORG","012001","REG","CLPMET","7440-47-3","19.20","","0.9","","",T,T,""
"INORG","012001","REG","CLPMET","7440-48-4","4.50","","","B","",T,T,""
"INORG","012001","REG","CLPMET","7440-70-2","94200.00","","","*","J",T,T,""
"INORG","012001","REG","CLPMET","7440-41-7","0.23","","0.23","U","U",T,T,""
"INORG","012001","REG","CLPMET","7440-43-9","0.69","","0.69","U","U",T,T,""
"INORG","012001","REG","CLPMET","7440-36-0","8.70","","8.70","UN","R",T,T,""
"INORG","012001","REG","CLPMET","7440-39-3","47.70","","","","",T,T,""
"INORG","012001","REG","CLPMET","7440-50-8","26.70","","","","",T,T,""
```

```
"INORG","012001","REG","CLPMET","7439-89-6","10200.00","","","","",T,T,""
"INORG","012001","REG","CLPMET","7440-62-2","12.60","","","","",T,T,""
"INORG","012001","REG","CLPMET","7440-66-6","74.60","","","E","J",T,T,""
"INORG","012001","REG","CLPMET","7440-23-5","129.00","","","B","",T,T,""
"INORG","012001","REG","CLPMET","7440-02-0","10.10","","","","",T,T,""
"INORG","012001","REG","CLPMET","7440-22-4","0.69","","0.69","U","U",T,T,""
"INORG","012001","REG","CLPMET","7439-95-4","32000.00","","","*","J",T,T,""
"INORG","012001","REG","CLPMET","7439-96-5","324.00","","","","",T,T,""
"INORG","012001","REG","CLPMET","71-55-6","5200.00","","5","","",T,T,""
"INORG","012001","REG","CLPMET","7440-09-7","943.00","","","B","",T,T,""
"ORSVO","012002","REG","CLPSVO","84-66-2","390","","390","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","121-14-2","390","","390","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","7005-72-3","390","","390","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","100-01-6","940","","940","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","86-73-7","89","","390","J","J",T,T,""
"ORSVO","012002","REG","CLPSVO","86-30-6","390","","390","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","534-52-1","940","","940","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","132-64-9","390","","390","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","51-28-5","940","","940","U","UJ",T,T,""
"ORSVO","012002","REG","CLPSVO","100-02-7","940","","940","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","88-74-4","940","","940","U","U",T,T,""
"ORSVO","012002","REG","CLPSVO","91-58-7","390","","390","U","U",T,T,""
```

Example of TICS.CSV format:

```
"ORSVO","012002","REG","CLPSVO","",33.37,"ALKDEHYDE","210","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",31.57,"ALKANE + PNA","130","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",31.92,"PNA + MIXED SPECTRA","310","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",34.32,"OXY HYDROCARBON","560","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",35.24,"PNA, MW=252","1300","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",34.46,"PNA, MW=252","400","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",9.29,"OXY HYDROCARBON","520","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",35.89,"PNA, MW=252","480","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",37.94,"ALKANE @ C32","880","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",31.44,"C1 ALKYL CHRYSENE","360","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",34.19,"ALKANE @ C29","480","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",28.04,"PNA, MW=215","370","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",28.16,"C1 ALKYL PYRENE","330","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",30.52,"PNA, MW=228","310","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",29.24,"OXY PNA","260","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",26.29,"C4 PCB","270","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",27.87,"PNA, MW=216","670","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",29.76,"PNA, MW=230","240","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",29.51,"PNA, MW=234","330","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",29.66,"PNA, MW=226","330","J","NJ",,T,""
"ORSVO","012002","REG","CLPSVO","",29.59,"PNA, MW=228","530","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",34.21,"ALKANE @C29","280","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",33.39,"UNSATURATED HYDROCARBON","85","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",31.59,"ALKANE @C27","130","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",34.37,"POLY-CHLORINATED HYDROCARBON","160","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",35.87,"PNA MW=252","220","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",34.44,"UNSATURATED HYDROCARBON","270","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",30.52,"PNA MW=228","160","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",35.24,"PNA MW=252","630","J","NJ",,T,""
"ORSVO","072001","REG","CLPSVO","",37.96,"ALKANE @C32","420","J","NJ",,T,""
```

MOUND

Environmental
Restoration
Program

Method: Q-014

Laboratory Data Reporting - Tier II - Data Summary Report

Revision 1.0

Mound Plant
Miamisburg, OH

Source Document: Compendium (November 1996)

1. INTRODUCTION

The procedures described herein are reporting requirements designed to provide data which is unlikely to be used for litigation and will not require data validation. These procedures describe the laboratory hardcopy reporting requirements, including data package content, data package organization, and approved data qualifiers.

2. RESPONSIBILITIES

Not applicable

3. PROCEDURES

3.1. Data Summary Contents

Laboratory data reports will contain a case narrative, the sample results on Form I's, and the results for all associated Quality Control Samples (LCS, MS, MSD, etc.). A copy of the chain-of-custody form, with all relinquished signatures, will accompany each data package. In addition to these specified paper (hardcopy) results, the laboratory shall submit an electronic data deliverable compliant to Compendium Method Q-010, Q-011, Q-012, and/or Q-013, as appropriate.

The case narrative will contain the following information for each laboratory batch:

- date of issue;
- the laboratory analysis performed;
- any deviations from the stated analytical method;
- the laboratory batch number;
- the laboratory SOP number and revision date;
- the number of samples and the sample matrices;
- a reference to the quality control procedures performed for the specific methods used, including the reference to the acceptance criteria used;
- the project name and number;
- the date of the sample receipt and the sample condition (e.g., whether preserved and packaged properly);
- a cross-reference between the field sample identification and the laboratory identification;
- whether sample holding times were met and identification of those samples for which they were not met;
- any observations that may have had an impact on the analyses;
- any technical problems affecting the analysis and corrective actions taken;
- laboratory quality control checks that did not meet the project criteria (as specified in the QAPP) and/or laboratory criteria (include any corrective actions taken and any known possible reasons for the results); and
- the laboratory manager's signature approving the issuance of the data package.

3.2. Laboratory Data Qualifiers

3.2.1. CLP Organic Laboratory Data Qualifiers

The following qualifiers will be applied to the organic analysis results by the laboratory, in accordance with CLP SOW directions.

- U -	Indicates compound was analyzed for, but not detected. The associated sample quantitation limit will be CRQL, corrected for dilution and for percent moisture.
- J -	Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) assuming a 1:1 response, 2) when the qualitative data indicated the presence of a compound that meets the volatile, semi-volatile, and pesticide/Aroclor identification criteria, and the result is less than the CRQL but greater than zero.
- N -	Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds, where identification is based on a mass spectral library search.
- P -	Used for pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns.
- C -	Applies to pesticide results where the identification has been confirmed by GC/MS.
- B -	Used when the analyte is found in the associated blank as well as in the sample. This flag must be used for a TIC as well as for a positively identified target compound.
- E -	Identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D -	Identifies all compounds identified in an analysis at a secondary dilution factor.
- A -	Indicates that a TIC is a suspected aldol-condensation product.

3.2.2. CLP Inorganic Laboratory Data Qualifiers

The following qualifiers will be applied to the inorganic analysis results by the laboratory, in accordance with CLP SOW directions:

- B -	Indicates that the reported value was obtained from a reading that was less than the CRDL but greater than or equal to the Instrument Detection Limit (IDL).
- U -	Indicates that the analyte was analyzed for, but not detected.
- E -	Indicates that the reported value is estimated because of the presence of interferences.
- M -	Duplicate injection precision was not met.
- N -	Spiked sample recovery not within control limits.
- S -	Reported value was determined by the Method of Standard Additions (MSA).
- W -	Post-digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * -	Duplicate analysis not within control limits.
- + -	Correlation coefficient for the MAS is less than 0.995.

Method qualifiers for inorganic procedures are detailed in the CLP SOW.

3.2.3. Non-CLP Qualifiers

The following qualifier will be applied for Non-CLP results by the laboratory:

- U -	Indicates the analyte was analyzed for, but not detected.

3.2.4. Other Qualifiers

Approval by the EG&G subcontractor is required for any additional data qualifiers used by the laboratory, other than those defined above, prior to submitting hardcopy data packages.