Appendices

I. DESCRIPTION OF ORGANICS AND INORGANICS DATA REVIEW PACKAGES 125

II. LISTING OF COMMON POLLUTANTS GENERATED BY SEVEN INDUSTRIES 153

III. LISTING OF ANALYTES, METHODS, AND DETECTION OR QUANTITATION LIMITS FOR POLLUTANTS OF CONCERN TO RISK ASSESSMENT 167

IV. CALCULATION FORMULAS FOR STATISTICAL EVALUATION 235

V. "J" DATA QUALIFIER SOURCE AND MEANING 239

VI. "R" DATA QUALIFIER SOURCE AND MEANING 245

VII. SUMMARY OF COMMON LABORATORY CONTAMINANTS, CONCENTRATION REQUIREMENTS, AND RISK ASSESSMENT IMPLICATIONS 249

VIII. CLP ANALYTICAL METHODS SHORT SHEETS AND TCL COMPOUNDS 253

IX. EXAMPLE DIAGRAM FOR A CONCEPTUAL MODEL FOR RISK ASSESSMENT 263

APPENDIX I
DESCRIPTION OF ORGANICS AND INORGANICS DATA REVIEW PACKAGES

The purpose of Appendix I is to familiarize the reader with a model for data review deliverables. This appendix consists of the following items:

- o A description of the data reporting format,
- o An example of a data review summary, and
- o Example data review forms.

Please note that the example forms are designed for the validation of Contract Laboratory Program (CLP) data packages. An example form is included for each analytical fraction (volatiles, semivolatiles, pesticide/Aroclors and metals) and for samples from soil/sediment and aqueous matrices. These forms nevertheless include the necessary information for the review of most types of data (analytical results, sample quantitation/detection limits, data qualifiers, etc.) not associated with the CLP.

1. DATA REPORTING FORMATS

Whenever an analytical laboratory is requested to analyze field samples for a specific site, the RPM (in consultation with the technical project team) must ensure that the laboratory will provide adequate documentation to support all current and future uses of the data. Potential uses of the data can include data validation, monitoring, modeling, risk assessment, site characterization, Record of Decision defense, enforcement, and litigation.

Data packages produced by analytical laboratories should contain all the documents that were produced or used by the laboratory for that particular analysis. The required documents should include a narrative (detailing the exact method performed, deviations from the method, problems encountered, and problem resolution), chain-of-custody records, laboratory logbook pages, and raw data and tabulated summary forms for all standards, quality control and field samples.

The documents should be organized in a logical manner and the entire data package should be paginated. Generally, the laboratory should be required to produce a data package with documents ordered in the following manner:

1) Narrative
2) Tabulated summary forms for laboratory standards and quality control samples (in chronological order by type of quality control sample/standard by date of analysis by instrument)
3) Tabulated summary forms for field sample results (in increasing RAS, SAS, or project sample number order)
4) Raw data for field samples (in increasing RAS, SAS, or project sample number order)
5) Raw data for laboratory standards and quality control samples (in chronological order by type of quality control sample/standard by date of analysis by instrument)
6) Laboratory logbook pages
7) Chain-of-custody records

It is often convenient to require that the laboratory data package resemble as closely as possible the data packages required by the current CLP RAS SOWs for organics and inorganics, that the tabulated summary forms provided in those SOWs be utilized and modified appropriately, and that the data qualifiers in those SOWs be applied to the data as appropriate. The following sections describe specific requirements for the content of each document contained in the laboratory data package.

NARRATIVE:

A narrative must be provided describing the analytical methods and exact procedures performed by the laboratory, as well as any deviations from the method. Problems encountered during analysis, problem resolution and any factors which may affect the validity of the data must be addressed. The narrative must include the laboratory name and RAS, SAS, or project sample numbers cross-referenced to the laboratory sample identification numbers, and must be signed and dated by the laboratory manager.

Any telephone communications between the laboratory and sampling personnel (or other parties outside of the laboratory) to resolve sampling discrepancies or analytical problems must be documented in detail on telephone communication logs. Those telephone logs must explicitly detail the problems requiring resolution, the agreed to resolution, and the names and affiliations of the communicating parties. All telephone logs must be appended to the narrative.

An example calculation of a positive hit and a detection/quantitation limit for each type of sample analysis must be provided. All equations, dilution factors and information required to reproduce the laboratory results must be provided.

TABULATED SUMMARY FORMS:

Laboratory Standards and Quality Control Samples

Tabulated summary forms must be provided for all laboratory standards, tunes, blanks, duplicates, spikes, and any other types of laboratory quality control samples/standards. The tabulated summary forms must contain information pertinent to the type of laboratory quality control sample/standard which was analyzed. Typical entries include: concentrations spiked, concentrations detected, spike compound names, results of statistical calculations (%R, %D, RPD, RSD, CV, RRF, SD, etc.), sample identification numbers, dates/times of analysis, instrument IDs, lab file IDs, and QC limits.

The exact format of each tabulated summary form will depend on the particular analysis method requested and the quality control procedures specified in that method. However, comprehensive tabulated summary forms must be prepared for all quality control samples/standards analyzed by the laboratory. For example, typical tabulated summary forms for volatile organics analyses include but are not limited to:

Surrogate results: Tabulate the sample identification numbers, surrogate compounds added, concentration added, percent recoveries, and QC limits for all standards, blanks, quality control samples and field samples. Flag outliers.

Matrix spike and matrix spike duplicate results: Tabulate the matrix spike compounds added, concentration added, percent recoveries and relative percent differences for the spiked compounds, and QC limits. Flag outliers. List the sample identification numbers. Results for

all non-spike compounds must be tabulated on the form used to summarize field sample results.

Method/laboratory blanks: Tabulate the sample identification numbers, lab file IDs, and time analyzed for field samples and matrix spike samples which pertain to each blank on a separate form. The form must also contain the GC column, instrument ID, laboratory sample identification number, lab file ID, and date/time of analysis for the blank itself. Results for each blank must also be tabulated on the form used to summarize field sample results.

Tuning results: Tabulate the m/e, ion abundance criteria, and percent relative abundances and list the tune compound name, instrument ID, lab file ID, and date/time of injection which pertain to each tune analysis on a separate form. The form must also contain tabulated sample identification numbers, lab file IDs, and date/time of analysis for all field samples, matrix spike samples, blanks, and standards which pertain to that tune. Flag outliers.

Initial calibration results: Tabulate the target compound names, relative response factors for each target and surrogate compound at each standard concentration, mean relative response factors and percent relative standard deviations for all target and surrogate compounds, and QC limits for each initial calibration on a separate form. The form must also contain the concentration of the calibration standards, instrument ID, lab file IDs, and dates/times of standard analyses for that initial calibration. Flag outliers.

Continuing calibration results: Tabulate the target compound names, mean relative response factors from initial calibration, relative response factors from continuing calibration, percent differences, and QC limits for all target and surrogate compounds for each continuing calibration on a separate form. The form must also contain the concentration of the continuing calibration standard, instrument ID, lab file ID, and dates/times of initial and continuing calibration standard analyses which pertain to that continuing calibration. Flag outliers.

Internal standard results: Tabulate the sample identification numbers, internal standard compound names, QC limits, retention times and area counts of the quantitation ion for each internal standard compound in the continuing calibration standard and all field samples, matrix spike samples, and blanks which pertain to that continuing calibration on a separate form. The form must also contain the instrument ID, lab file ID, and date/time of continuing calibration standard analysis. Flag outliers.

MDL study results: Tabulate the target compound names, concentrations spiked and detected for each MDL spike analysis, and the standard deviation and calculated MDL for each target compound. (Note: The narrative must explain the MDL procedure utilized to generate the values. The formula and associated constant values utilized in the calculation of the MDL for each analyte must be provided. The column, instrument ID, trap composition, and operating conditions must be clearly displayed on the raw data.)

Field Samples

The exact format of the tabulated summary form for each field sample will depend on the particular analysis method requested. However, comprehensive tabulated summary forms must be prepared for each field sample analyzed by the laboratory. At a minimum, the target compound names, concentration units, positive hits and numerical detection/quantitation limits and any laboratory qualifier flags for each target compound must be tabulated on a separate form. Definitions must be provided for all qualifier flags used by the laboratory. For each

sample, the tabulated form must also contain the RAS, SAS, or project sample identification number, laboratory name, laboratory sample ID, lab file ID, sample matrix type, and level of analysis (low, medium, high). The percent moisture/solids, weights and volumes of sample prepared/purged/extracted/digested/analyzed, initial and final extract/digest and extract clean-up volumes, injection volume, clean-ups performed, dilution factor, measured pH, and dates that sample was received/extracted/digested/analyzed should be included as appropriate to the analysis method.

RAW DATA:

Raw data must be provided by the laboratory for all laboratory quality control samples, blanks, spikes, duplicates, standards, and field samples. The exact format and content of the raw data will depend on the particular analysis method requested. However, any and all instrument printouts, strip chart recordings, chromatograms, quantitation reports, mass spectra and other types of raw data generated by the laboratory for a particular project must be provided in the data package. Typical raw data for organic GC/MS analyses includes but is not limited to:

- Reconstructed total ion chromatograms,
- Instrument quantitation reports containing the following information: laboratory sample identification number, RAS, SAS or project sample number, date and time of analysis, RT and/or scan number of quantitation ion with measured area, analyte concentration, copy of area table from data system, GC/MS instrument ID, lab file ID, column, trap composition, and operating conditions,
- Raw and enhanced mass spectra for all positive field sample results and daily continuing calibration standard reference spectra for all positive field sample results,
- Mass spectra and three library searched best-match mass spectra for all tentatively identified compounds reported, and
- Instrument normalized mass listing and the mass spectrum for each tune.

Typical raw data for inorganic analyses includes but is not limited to:

- Instrument printouts and strip chart recordings containing the following information: laboratory sample identification number, RAS, SAS or project sample number, date and time of analysis, absorbance/emissions values, analyte concentration, instrument ID, lab file ID, and operating conditions, and
- Standard curve raw data, plotted standard curves, linear regression equations, and correlation coefficients.

LABORATORY LOGBOOK PAGES:

Copies of standards preparation logs, sample preparation/extraction/digestion logs, sample analysis run logs, personal logs, and any hand written project-specific notes must be included. The initial and final volumes of sample prepared/purged/extracted/digested, initial

and final extract/digest and extract clean-up volumes, injection volumes, and dilution factors must be clearly labelled.

CHAIN-OF-CUSTODY RECORDS:

All chain-of-custody records provided to the laboratory during sample shipment or generated by the laboratory during sample receipt, storage, preparation, and analysis must be included. Chain-of-custody records include but are not limited to: signed and dated field chain-of-custody forms, signed and dated shipping airbills, sample tags, SAS packing lists, RAS Traffic Reports, internal laboratory receiving records, and internal laboratory sample/extract/digest transfer records.

2. DATA REVIEW SUMMARY

ORGANIC DATA SUMMARY FORMS UTILIZED BY REGION III IN THE CLP

DATE:

SUBJECT:

FROM:

TO:

THRU:

OVERVIEW

Case consisted of four (4) low level water and two (2) low level soil samples, submitted for full organic analyses. Included in this data set was one (1) equipment blank and one (1) trip blank. The trip blank was analyzed for volatiles only. The samples were analyzed as a Contract Laboratory Program (CLP) Routine Analytical Service (RAS).

SUMMARY

All samples were successfully analyzed for all target compounds with the exception of 2-Butanone and 2-Hexanone in the volatile fraction. All remaining instrument and method sensitivities were according to the Contract Laboratory Program (CLP) Routine Analytical Service (RAS) protocol.

MAJOR PROBLEM

The response factors (RF) for 2-Butanone and 2-Hexanone were less than 0.05 in one of the continuing volatile calibration. The quantitation limits for this compound in the affected samples were qualified unreliable, "R". (See Table I in Appendix F for the affected samples.)

MINOR PROBLEMS

Several compounds failed precision criteria for initial and/or continuing calibrations. Quantitation limits and the reported results for these compounds may be biased and, therefore, have been qualified estimated, "UJ" and "J", respectively. (See Table I in Appendix F for the affected samples).

2. DATA REVIEW SUMMARY

NOTES

- The soil semivolatile MS/MSD analyses were originally extracted within the technical and contractual holding times. Re-extractions were required because of surrogate recoveries, and these re-extractions were performed outside of holding times. Surrogate recoveries were again outside of the QC limits, therefore, original sample results are being reported.

- The maximum concentration of compounds found in the trip blanks, field blanks, or method blanks are listed below. All samples with concentrations of common laboratory contaminants less than ten times (<10X) the blank concentration, and uncommon laboratory contaminants less than five times (<5X) the blank concentration have been qualified "B" in the data summary table. (See Appendix F).

Compound	Concentration (ug/L)
Methylene chloride *	7 J
Acetone *	9 J
Bis(2-ethylhexyl)phthalate *	10 J

* Common Laboratory Contaminant

- The semivolatile MS/MSD analyses had compounds other than the spiking compounds present. The following is a table of results and precision estimates for the non-spiked compounds:

MS/MSD Non-Spiked Compounds

Compound	Concentration (ug/L)			%RSD
Phenanthrene	150 J	190 J	140 J	16.5
Fluoranthene	340 J	470 J	440 J	16.3
Benzo(a)anthracene	290 J	310 J	320 J	5.0
Chrysene	290 J	330 J	300 J	6.8
Bis (2-ethylhexyl) phthalate	160 J	200 J	240 J	20.0
Benzo (b)pyrene	190 J	240 J	240 J	12.9
Benzo (k) pyrene	230 J	200 J	220 J	7.1
Benzo (a) pyrene	240 J	190 J	240 J	12.9

RSD= Relative Standard Deviation

2. DATA REVIEW SUMMARY

- The pesticide/PCB analyses of all soil samples and associated QC samples had surrogate recoveries in excess of the QC limit. Since no positive results were reported for any pesticide or PCB compounds for any of the samples in this case no data was affected. (See Appendix F).

- The reported Tentatively Identified Compounds (TIC's) in Appendix D have been reviewed and accepted or corrected.

- All data for Case were reviewed in accordance with the Functional Guidelines for Evaluating Organic Analyses with modifications for use within Region III. The text of this report addresses only those problems affecting usability.

ATTACHMENTS

APPENDIX A - Glossary of Data Qualifiers
APPENDIX B - Data Summary. These include:
(a) All positive results for target compounds with qualifier codes where applicable.
(b) All unusable detection limits (qualified "R").
APPENDIX C - Results as Reported by the Laboratory for All Target Compounds
APPENDIX D - Reviewed and Corrected Tentatively Identified Compounds
APPENDIX E - Organic Regional Data Assessment Summary
APPENDIX F - Support Documentation

TEMPA2-9

TABLE_____

CLP INORGANIC ANALYSIS AQUEOUS SAMPLE DETECTION LIMITS (ug/l)

PAGE __ of __

CERCLIS SITE NAME_____

CASE No._____, SDG No._____

Sample Location												
Sample Number												
Traffic Report Number												
Remarks												
Sampling date												
Analysis Date												
Inorganic Analytes		IDL(ug/L)										
Aluminum	P											
Antimony	P											
Arsenic	F											
Barium	P											
Beryllium	P											
Cadmium	P											
Calcium	P											
Chromium	P											
Cobalt	P											
Copper	P											
Iron	P											
Lead	F											
Magnesium	P											
Manganese	P											
Mercury	CV											
Nickel	P											
Potassium	P											
Selenium	F											
Silver	P											
Sodium	P											
Thallium	F											
Vanadium	P											
Zinc	P											
Cyanide	C											

Analytical Method
F Furnace AA
P ICP/Flame AA
CV Cold Vapor
C Colorimetric

NOTE:
UJ The detection limit is approximated due to limitations identified in the quality control review (data validation).
R Value is rejected.
NA Not Analyzed.

Sample's wet weight (gms)											
for Hg analysis											
for ICP analysis											
for furnace AA analysis											
for Cyanide analysis											

TEMPL2-9

TABLE_____

CLP INORGANIC ANALYSIS SOIL AND SEDIMENT SAMPLE DETECTION LIMITS (ug/l)

PAGE __ of __

CERCLIS SITE NAME_____

CASE No._____, SDG No._____

Sample Location												
Sample Number												
Traffic Report Number												
Remarks												
Sampling date												
Analysis Date												
Percent Solids												
Inorganic Analytes		IDL(ug/L)										
Aluminum	P											
Antimony	P											
Arsenic	F											
Barium	P											
Beryllium	P											
Cadmium	P											
Calcium	P											
Chromium	P											
Cobalt	P											
Copper	P											
Iron	P											
Lead	F											
Magnesium	P											
Manganese	P											
Mercury	CV											
Nickel	P											
Potassium	P											
Selenium	F											
Silver	P											
Sodium	P											
Thallium	F											
Vanadium	P											
Zinc	P											
Cyanide	C											

Analytical Method
F Furnace AA
P ICP/Flame AA
CV Cold Vapor
C Colorimetric

NOTE:
UJ The detection limit is approximated due to limitations identified in the quality control review (data validation).
R Value is rejected.
NA Not Analyzed.

Sample's wet weight (gms)												
for Hg analysis												
for ICP analysis												
for furnace AA analysis												
for Cyanide analysis												

TEMPL2-1

TABLE_____

CLP INORGANIC ANALYSIS SOIL ANALYTICAL RESULTS (ug/kg)

PAGE _____ of _____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location												
Sample Number												
Traffic Report Number												
Remarks												
Sampling date												
Inorganic analytes		CRDL										
Aluminum	P	200										
Antimony	P	60										
Arsenic	F	10										
Barium	P	200										
Beryllium	P	5										
Cadmium	P	5										
Calcium	P	5000										
Chromium	P	10										
Cobalt	P	50										
Copper	P	25										
Iron	P	100										
Lead	P	3										
Magnesium	P	5000										
Manganese	P	15										
Mercury	CV	0.2										
Nickel	P	40										
Potassium	P	5000										
Selenium	F	5										
Silver	P	10										
Sodium	P	5000										
Thallium	F	10										
Vanadium	P	50										
Zinc	P	20										
Cyanide	C	10										

Analytical Method

F Furnace

P ICP/Flame AA

CV Cold Vapor

C Colorimetric

J Quantitation is approximated due to limitations identified during the quality control review.

R Value is rejected.

U Revised Sample Quantitation Limit.

UJ Quantitation limit is approximate due to limititations identified in the quality control review.

NA Not Analyzed.

Sample results are reported on a dry weight basis.

TEMPL2-7

TABLE_____

CLP INORGANIC ANALYSIS AQUEOUS ANALYTICAL RESULTS (ug/l)

PAGE _____ of _____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location												
Sample Number												
Traffic Report Number												
Remarks												
Sampling date												
Inorganic analytes		CRDL										
Aluminum	P	200										
Antimony	P	60										
Arsenic	F	10										
Barium	P	200										
Beryllium	P	5										
Cadmium	P	5										
Calcium	P	5000										
Chromium	P	10										
Cobalt	P	50										
Copper	P	25										
Iron	P	100										
Lead	P	3										
Magnesium	P	5000										
Manganese	P	15										
Mercury	CV	0.2										
Nickel	P	40										
Potassium	P	5000										
Selenium	F	5										
Silver	P	10										
Sodium	P	5000										
Thallium	F	10										
Vanadium	P	50										
Zinc	P	20										
Cyanide	C	10										

Analytical Method
F Furnace
P ICP/Flame AA
CV Cold Vapor
C Colorimetric

J Quantitation is approximated due to limitations identified during the quality control review.
R Value is rejected.
U Revised Sample Quantitation Limit.
UJ Quantitation limit is approximate due to limititations identified in the quality control review.
NA Not Analyzed.
Sample results are reported on a dry weight basis.

TNP2-1-1

TABLE_____

CLP VOLATILE ORGANIC ANALYSIS AQUEOUS ANALYTICAL RESULTS (ug/l)

PAGE _____ of

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location											
Sample Number											
Traffic Report Number											
Remarks											
Sampling Date											
Analysis Date											
Volatile Organic Compound	CRQL										
Chloromethane	10										
Bromomethane	10										
Vinyl Chloride	10										
Chloroethane	10										
Methylene Chloride	5										
Acetone	10										
Carbon Disulfide	5										
1,1-Dichloroethene	5										
1,1-Dichloroethane	5										
1,2-Dichloroethene(Total)	5										
Chloroform	5										
1,2-Dichloroethane	5										
2-Butanone	10										
1,1,1-Trichloroethane	5										
Carbon Tetrachloride	5										
Vinyl Acetate	10										
Bromodichloromethane	5										
1,2-Dichloropropane	5										
cis-1,3-Dichloropropene	5										
Trichloroethene	5										
Dibromochloromethane	5										
1,1,2-Trichloroethane	5										
Benzene	5										
trans-1,3-Dichloropropene	5										
Bromoform	5										
4-Methyl-2-pentanone	10										
2-Hexanone	10										
Tetrachloroethene	5										
1,1,2,2-Tetrachloroethane	5										
Toluene	5										
Chlorobenzene	5										
Ethylbenzene	5										
Styrene	5										
Xylene (Total)	5										

CRQL Contract Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review.
UJ Quantitation limit is approximated due to limitations identified in the quality control review.
R Value is rejected.

TMP2-2-1

TABLE_____

CLP VOLATILE ORGANIC ANALYSIS SOIL ANALYTICAL RESULTS (ug/kg)

PAGE_____ of_____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location												
Sample Number												
Traffic Report Number												
Remarks												
Sampling Date												
Analysis Date												
Volatile Organic Compound	CRQL											
Chloromethane	10											
Bromomethane	10											
Vinyl Chloride	10											
Chloroethane	10											
Methylene Chloride	5											
Acetone	10											
Carbon Disulfide	5											
1,1-Dichloroethene	5											
1,1-Dichloroethane	5											
1,2-Dichloroethene (Total)	5											
Chloroform	5											
1,2-Dichloroethane	5											
2-Butanone	10											
1,1,1-Trichloroethane	5											
Carbon Tetrachloride	5											
Vinyl Acetate	10											
Bromodichloromethane	5											
1,2-Dichloropropane	5											
cis-1,3-Dichloropropene	5											
Trichloroethene	5											
Dibromochloromethane	5											
1,1,2-Trichloroethane	5											
Benzene	5											
trans-1,3-Dichloropropene	5											
Bromoform	5											
4-Methyl-2-pentanone	10											
2-Hexanone	10											
Tetrachloroethene	5											
1,1,2,2-Tetrachloroethane	5											
Toluene	5											
Chlorobenzene	5											
Ethylbenzene	5											
Styrene	5											
Xylene (Total)	5											

CRQL Contract Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review.
UJ Quantitation limit is approximate due to limitations identified in the quality control review
R Value is rejected.

THP2-3-1

TABLE_____

CLP VOLATILE ORGANIC ANALYSIS SOIL SAMPLE QUANTITATION LIMITS (ug/kg)

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Dilution Factor										
Percent Solids										
Volatile Organic Compound										
Chloromethane										
Bromomethane										
Vinyl Chloride										
Chloroethane										
Methylene Chloride										
Acetone										
Carbon Disulfide										
1,1-Dichloroethene										
1,1-Dichloroethane										
1,2-Dichloroethene (Total)										
Chloroform										
1,2-Dichloroethane										
2-Butanone										
1,1,1-Trichloroethane										
Carbon Tetrachloride										
Vinyl Acetate										
Bromodichloromethane										
1,2-Dichloropropane										
cis-1,3-Dichloropropene										
Trichloroethene										
Dibromochloromethane										
1,1,2-Trichloroethane										
Benzene										
trans-1,3-Dichloropropene										
Bromoform										
4-Methyl-2-pentanone										
2-Hexanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene										
Ethylbenzene										
Styrene										
Xylene (Total)										

Sample Quantitation limits are reported on a dry weight basis.
UJ Quantitation limit is approximated due to limitations during the quality control review.
R Value is rejected.

THP2-3-2

CLP VOLATILE ORGANIC ANALYSIS AQUEOUS SAMPLE QUANITATION LIMITS (ug/l)

CERCLIS SITE NAME_____

CASE No._____, SDG No._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Dilution Factor										
Volatile Organic Compound										
Chloromethane										
Bromomethane										
Vinyl Chloride										
Chloroethane										
Methylene Chloride										
Acetone										
Carbon Disulfide										
1,1-Dichloroethene										
1,1-Dichloroethane										
1,2-Dichloroethene (Total)										
Chloroform										
1,2-Dichloroethane										
2-Butanone										
1,1,1-Trichloroethane										
Carbon Tetrachloride										
Vinyl Acetate										
Bromodichloromethane										
1,2-Dichloropropane										
cis-1,3-Dichloropropene										
Trichloroethene										
Dibromochloromethane										
1,1,2-Trichloroethane										
Benzene										
trans-1,3-Dichloropropene										
Bromoform										
4-Methyl-2-pentanone										
2-Hexanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene										
Ethylbenzene										
Styrene										
Xylene (Total)										

Sample Quantitation limits are reported on a dry weight basis.
UJ Quantitation limit is approximated due to limitations during the quality control review.
R Value is rejected.

TMP2-4-1

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS AQUEOUS ANALYTICAL RESULTS (ug/l)

PAGE_____OF_____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location												
Sample Number												
Traffic Report Number												
Remarks												
Sampling Date												
Extraction Date												
Analysis Date												
Semi-Volatile Compound	CRQL											
Phenol	10											
bis (2-Chloroethyl) ether	10											
2-Chlorophenol	10											
1,3-Dichlorobenzene	10											
1,4-Dichlorobenzene	10											
Benzyl Alcohol	10											
1,2-Dichlorobenzene	10											
2-Methylphenol	10											
bis (2-Chloroisopropyl)ether	10											
4-Methylphenol	10											
N-Nitroso-di-n-propylamine	10											
Hexachloroethane	10											
Nitrobenzene	10											
Isophorone	10											
2-Nitrophenol	10											
2,4-Dimethylphenol	10											
Benzoic acid	50											
bis (2-Chloroethoxy) methane	10											
2,4-Dichlorophenol	10											
1,2,4-Trichlorobenzene	10											
Naphthalene	10											
4-Chloroaniline	10											
Hexachlorobutadiene	10											
4-Chloro-3-methylphenol	10											
2-Methylnaphthalene	10											
Hexachlorocyclopentadiene	10											
2,4,6-Trichlorophenol	10											
2,4,5-Trichlorophenol	50											
2-Chloronaphthalene	10											
2-Nitroaniline	50											
Dimethylphthalate	10											
Acenaphthylene	10											
2,6-Dinitrotoluene	10											

CRQL Contract Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review.
UJ Quantitation limit is approximated due to limitations identified in the quality control review.
R Value is rejected.

TMP2-4-2

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS AQUEOUS ANALYTICAL RESULTS (ug/l)

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO.:_____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Extraction Date										
Analysis Date										
Semi-Volatile Compound	CRQL									
3-Nitroaniline	50									
Acenaphthene	10									
2,4-Dinitrophenol	50									
4-Nitrophenol	50									
Dibenzofuran	10									
2,4-Dinitrotoluene	10									
Diethylphthalate	10									
4-Chlorophenyl-phenylether	10									
Fluorene	10									
4-Nitroaniline	50									
4,6-Dinitro-2-methylphenol	50									
N-Nitrosodiphenylamine	10									
4-Bromophenyl-phenylether	10									
Hexachlorobenzene	10									
Pentachlorophenol	50									
Phenanthrene	10									
Anthracene	10									
Di-n-butylphthalate	10									
Fluoranthene	10									
Pyrene	10									
Butylbenzylphthalate	10									
3,3'-Dichlorobenzidine	20									
Benzo(a)anthracene	10									
Chrysene	10									
bis(2-Ethylhexyl)phthalate	10									
Di-n-octyl phthalate	10									
Benzo(b)fluoranthene	10									
Benzo(k)fluoranthene	10									
Benzo(a)pyrene	10									
Indeno (1,2,3-cd)pyrene	10									
Dibenz(a,h)anthracene	10									
Benzo(g,h,i)perylene	10									

CRQL Contract Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review.
UJ Quantitation limit is approximated due to limitations identified in the quality control review.
R Value is rejected.

TMP2-4-3

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS AQUEOUS ANALYTICAL RESULTS (ug/l)

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location											
Sample Number											
Traffic Report Number											
Remarks											
Sampling Date											
Extraction Date											
Analysis Date											
Pesticide/PCB Compound	CRQL										
alpha-BHC	0.05										
beta-BHC	0.05										
delta-BHC	0.05										
gamma-BHC (Lindane)	0.05										
Heptachlor	0.05										
Aldrin	0.05										
Heptachlor epoxide	0.05										
Endosulfan I	0.05										
Dieldrin	0.10										
4,4'-DDE	0.10										
Endrin	0.10										
Endosulfan II	0.10										
4,4'-DDD	0.10										
Endosulfan sulfate	0.10										
4,4'-DDT	0.10										
Methoxychlor	0.5										
Endrin ketone	0.10										
alpha-Chlordane	0.5										
gamma-Chlordane	0.5										
Toxaphene	1.0										
Aroclor-1016	0.5										
Aroclor-1221	0.5										
Aroclor-1232	0.5										
Aroclor-1242	0.5										
Aroclor-1248	0.5										
Aroclor-1254	1.0										
Aroclor-1260	1.0										

CRQL Contract Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review.
UJ Quantitation limit is approximated due to limitations identified in the quality control review.
R Value is rejected.

TMP2-4-4

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS AQUEOUS SAMPLE QUANTITATION LIMITS (ug/l)

PAGE_____of_____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Dilution Factor										
Percent Solids										
Semi-Volatile Compound										
3-Nitroaniline										
Acenaphthene										
2,4-Dinitrophenol										
4-Nitrophenol										
Dibenzofuran										
2,4-Dinitrotoluene										
Diethylphthalate										
4-Chlorophenyl-phenylether										
Fluorene										
4-Nitroaniline										
4,6-Dinitro-2-methylphenol										
N-Nitrosodiphenylamine										
4-Bromophenyl-phenylether										
Hexachlorobenzene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-butylphthalate										
Fluoranthene										
Pyrene										
Butylbenzylphthalate										
3,3'-Dichlorobenzidine										
Benzo(a)anthracene										
Chrysene										
bis(2-Ethylhexyl)phthalate										
Di-n-octyl phthalate										
Benzo(b)fluoranthene										
Benzo(k)fluoranthene										
Benzo(a)pyrene										
Indeno (1,2,3-cd)pyrene										
Dibenz(a,h)anthracene										
Benzo(g,h,i)perylene										

Sample Quantitation Limits are reported on dry weight basis.
UJ Quantitation Limits are approximate due to limitations identified during the quality control review.
R Value is rejected.

TMP2-4-5

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS AQUEOUS SAMPLE QUANTITATION LIMITS (ug/l)

PAGE_____of_____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Dilution Factor										
Percent Solids										
Semi-Volatile Compound										
Phenol										
bis (2-Chloroethyl) ether										
2-Chlorophenol										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
Benzyl Alcohol										
1,2-Dichlorobenzene										
2-Methylphenol										
bis (2-Chloroisopropyl)ether										
4-Methylphenol										
N-Nitroso-di-n-propylamine										
Hexachloroethane										
Nitrobenzene										
Isophorone										
2-Nitrophenol										
2,4-Dimethylphenol										
Benzoic acid										
bis (2-Chloroethoxy) methane										
2,4-Dichlorophenol										
1,2,4-Trichlorobenzene										
Naphthalene										
4-Chloroaniline										
Hexachlorobutadiene										
4-Chloro-3-methylphenol										
2-Methylnaphthalene										
Hexachlorocyclopentadiene										
2,4,6-Trichlorophenol										
2,4,5-Trichlorophenol										
2-Chloronaphthalene										
2-Nitroaniline										
Dimethylphthalate										
Acenaphthylene										
2,6-Dinitrotoluene										

Sample Quantitation Limits are reported on a dry weight basis.

UJ Quantitation limit is approximated due to limitations identified in the quality control review.

R Value is rejected.

TMP2-4-6

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS AQUEOUS SAMPLE QUANTITATION LIMITS (ug/l)

PAGE_____of___

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Dilution Factor										
Percent Solids										
Pesticide/PCB Compound										
alpha-BHC										
beta-BHC										
delta-BHC										
gamma-BHC (Lindane)										
Heptachlor										
Aldrin										
Heptachlor epoxide										
Endosulfan I										
Dieldrin										
4,4'-DDE										
Endrin										
Endosulfan II										
4,4'-DDD										
Endosulfan sulfate										
4,4'-DDT										
Methoxychlor										
Endrin ketone										
alpha-Chlordane										
gamma-Chlordane										
Toxaphene										
Aroclor-1016										
Aroclor-1221										
Aroclor-1232										
Aroclor-1242										
Aroclor-1248										
Aroclor-1254										
Aroclor-1260										

Sample Quantitation Limits are reported on dry weight basis.
UJ Quantitation Limits are approximate due to limitations identified during the quality control review.
R Value is rejected.

TMP2-5-1

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS SOIL ANALYTICAL RESULTS (ug/kg)

PAGE_____ of_____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location												
Sample Number												
Traffic Report Number												
Remarks												
Sampling Date												
Extraction Date												
Analysis Date												
Semi-Volatile Compound	CRQL											
Phenol	330											
bis (2-Chloroethyl) ether	330											
2-Chlorophenol	330											
1,3-Dichlorobenzene	330											
1,4-Dichlorobenzene	330											
Benzyl Alcohol	330											
1,2-Dichlorobenzene	330											
2-Methylphenol	330											
bis (2-Chloroisopropyl)ether	330											
4-Methylphenol	330											
N-Nitroso-di-n-propylamine	330											
Hexachloroethane	330											
Nitrobenzene	330											
Isophorone	330											
2-Nitrophenol	330											
2,4-Dimethylphenol	330											
Benzoic acid	1600											
bis (2-Chloroethoxy) methane	330											
2,4-Dichlorophenol	330											
1,2,4-Trichlorobenzene	330											
Naphthalene	330											
4-Chloroaniline	330											
Hexachlorobutadiene	330											
4-Chloro-3-methylphenol	330											
2-Methylnaphthalene	330											
Hexachlorocyclopentadiene	330											
2,4,6-Trichlorophenol	330											
2,4,5-Trichlorophenol	1600											
2-Chloronaphthalene	330											
2-Nitroaniline	1600											
Dimethylphthalate	330											
Acenaphthylene	330											
2,6-Dinitrotoluene	330											

CRQL Contract Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review.
UJ Quantitation is approximate due to limitations identified during the quality control review.
R Value is rejected.

THP2-5-2

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS SOIL ANALYTICAL RESULTS (ug/kg)

PAGE____of___

CERCLIS SITE NAME:_____

CASE NO._____, SDO NO._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Extraction Date										
Analysis Date										
Semi-volatile compound	CRQL									
3-Nitroaniline	1600									
Acenaphthene	330									
2,4-Dinitrophenol	1600									
4-Nitrophenol	1600									
Dibenzofuran	330									
2,4-Dinitrotoluene	330									
Diethylphthalate	330									
4-Chlorophenyl-phenylether	330									
Fluorene	330									
4-Nitroaniline	1600									
4,6-Dinitro-2-methylphenol	1600									
N-Nitrosodiphenylamine	330									
4-Bromophenyl-phenylether	330									
Hexachlorobenzene	330									
Pentachlorophenol	1600									
Phenanthrene	330									
Anthracene	330									
Di-n-butylphthalate	330									
Fluoranthene	330									
Pyrene	330									
Butylbenzylphthalate	330									
3,3'-Dichlorobenzidine	660									
Benzo(a)anthracene	330									
Chrysene	330									
bis(2-Ethylhexyl)phthalate	330									
Di-n-octyl phthalate	330									
Benzo(b)fluoranthene	330									
Benzo(k)fluoranthene	330									
Benzo(a)pyrene	330									
Indeno (1,2,3-cd)pyrene	330									
Dibenz(a,h)anthracene	330									
Benzo(g,h,i)perylene	330									

CRQL Contract Required Detection Limit.
J Quantitation is approximate due to limitations identified during the quality control review.
UJ Quantitation limit is approximte due to limitations identified in the quality control review.
R Value is rejected.

TMP2-5-3

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS SOIL ANALYTICAL RESULTS (ug/kg)

PAGE___of___

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location												
Sample Number												
Traffic Report Number												
Remarks												
Sampling Date												
Extraction Date												
Analysis Date												
Pesticide/PCB Compond	CRQL											
alpha-BHC	8.0											
beta-BHC	8.0											
delta-BHC	8.0											
gamma-BHC (Lindane)	8.0											
Heptachlor	8.0											
Aldrin	8.0											
Heptachlor epoxide	8.0											
Endosulfan I	8.0											
Dieldrin	16.0											
4,4'-DDE	16.0											
Endrin	16.0											
Endosulfan II	16.0											
4,4'-DDD	16.0											
Endosulfan sulfate	16.0											
4,4'-DDT	16.0											
Methoxychlor	80.0											
Endrin ketone	16.0											
alpha-Chlordane	80.0											
gamma-Chlordane	80.0											
Toxaphene	160.0											
Aroclor-1016	80.0											
Aroclor-1221	80.0											
Aroclor-1232	80.0											
Aroclor-1242	80.0											
Aroclor-1248	80.0											
Aroclor-1254	160.0											
Aroclor-1260	160.0											

CROL Contract Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review.
UJ Quantitation is approximate due to limitations identified in the quality control review.
R Value is rejected.

TMP2-6-1

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS SOIL SAMPLE QUANTITATION LIMITS (ug/kg)

PAGE_____of_____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Dilution Factor										
Percent Solids										
Semi-Volatile Compound										
Phenol										
bis (2-Chloroethyl) ether										
2-Chlorophenol										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
Benzyl Alcohol										
1,2-Dichlorobenzene										
2-Methylphenol										
bis (2-Chloroisopropyl)ether										
4-Methylphenol										
N-Nitroso-di-n-propylamine										
Hexachloroethane										
Nitrobenzene										
Isophorone										
2-Nitrophenol										
2,4-Dimethylphenol										
Benzoic acid										
bis (2-Chloroethoxy) methane										
2,4-Dichlorophenol										
1,2,4-Trichlorobenzene										
Naphthalene										
4-Chloroaniline										
Hexachlorobutadiene										
4-Chloro-3-methylphenol										
2-Methylnaphthalene										
Hexachlorocyclopentadiene										
2,4,6-Trichlorophenol										
2,4,5-Trichlorophenol										
2-Chloronaphthalene										
2-Nitroaniline										
Dimethylphthalate										
Acenaphthylene										
2,6-Dinitrotoluene										

Sample Quantitation Limits are reported on a dry weight basis.
UJ Quantitation limit is approximated due to limitations identified in the quality control review.
R Value is rejected.

TMP2-6-2

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS SOIL SAMPLE QUANTITATION LIMITS (ug/l)

PAGE_____of_____

CERCLIS SITE NAME:_____

CASE NO._____, SDG NO._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Dilution Factor										
Percent Solids										
Semi-Volatile Compound										
3-Nitroaniline										
Acenaphthene										
2,4-Dinitrophenol										
4-Nitrophenol										
Dibenzofuran										
2,4-Dinitrotoluene										
Diethylphthalate										
4-Chlorophenyl-phenylether										
Fluorene										
4-Nitroaniline										
4,6-Dinitro-2-methylphenol										
N-Nitrosodiphenylamine										
4-Bromophenyl-phenylether										
Hexachlorobenzene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-butylphthalate										
Fluoranthene										
Pyrene										
Butylbenzylphthalate										
3,3'-Dichlorobenzidine										
Benzo(a)anthracene										
Chrysene										
bis(2-Ethylhexyl)phthalate										
Di-n-octyl phthalate										
Benzo(b)fluoranthene										
Benzo(k)fluoranthene										
Benzo(a)pyrene										
Indeno (1,2,3-cd)pyrene										
Dibenz(a,h)anthracene										
Benzo(g,h,i)perylene										

Sample Quantitation Limits are reported on dry weight basis.
UJ Quantitation Limits are approximate due to limitations identified during the quality control review.
R Value is rejected.

TMP2-6-3

TABLE_____

CLP EXTRACTABLE ORGANIC ANALYSIS SOIL SAMPLE QUANTITATION LIMITS (ug/l)

PAGE_____of_____

CERCLIS SITE NAME_____

CASE NO._____, SDG NO._____

Sample Location										
Sample Number										
Traffic Report Number										
Remarks										
Sampling Date										
Dilution Factor										
Percent Solids										
Pesticide/PCB Compound										
alpha-BHC										
beta-BHC										
delta-BHC										
gamma-BHC (Lindane)										
Heptachlor										
Aldrin										
Heptachlor epoxide										
Endosulfan I										
Dieldrin										
4,4'-DDE										
Endrin										
Endosulfan II										
4,4'-DDD										
Endosulfan sulfate										
4,4'-DDT										
Methoxychlor										
Endrin ketone										
alpha-Chlordane										
gamma-Chlordane										
Toxaphene										
Aroclor-1016										
Aroclor-1221										
Aroclor-1232										
Aroclor-1242										
Aroclor-1248										
Aroclor-1254										
Aroclor-1260										

Sample Quantitation Limits are reported on dry weight basis.

UJ Quantitation Limits are approximate due to limitations identified during the quality control review.