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NAS PENSACOLA
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FINAL REMEDIAL INVESTIGATION REPORT VOLUME III OF III SITE 40 NAS PENSACOLA FL
1/20/1999
ENSAFE/ALLEN AND HOSHALL

FINAL REMEDIAL INVESTIGATION REPORT
SITE 40
NAVAL AIR STATION
PENSACOLA, FLORIDA

SOUTHNAVFACENGCOM
CONTRACT NUMBER:
N62467-89-D-0318
CTO — 0036

Volume III of III
Appendix I

Prepared for:

Comprehensive Long-Term Environmental Action Navy
Naval Air Station Pensacola, Florida

Prepared by:

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January 20, 1999

Appendix I

Toxicological Test Results

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	041M10
Date:	February 14, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	NAS Pensacola; Site 40 & 41
Date Sampled:	November 27, 1995
Number of Samples:	4 Aqueous Sample(s) with 0 MS/MSD(s) 12 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Low Volatiles, Volatiles, Low Semivolatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig M. Simpson
Eugene M. Watson, Vice President

3-4-96
Date

6716 Mexico Road · St. Peters, MO 63376
(314) 928-9533 · (314) 278-1828 · Fax (314) 278-2709

SDG# 041M10

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	LVOA		VOA		LSV		SV		P/P		TAL/C	
040TM01601	WATER	X											
041W130101	WATER	X				X				X		X	
041W5A0501	WATER	X				X				X		X	
041TM00401	WATER	X											
040MZ31301	SOIL				X				X		X		X
040MZ31501	SOIL				X				X		X		X
040MZ31901	SOIL				X				X		X		X
040MZ32001	SOIL				X				X		X		X
040MZ32101	SOIL				X				X		X		X
040MZ32201	SOIL				X				X		X		X
040MZ32301	SOIL				X				X		X		X
040NZ32301	SOIL				X				X		X		X
040MZ32401	SOIL				X				X		X		X
041M10A301	SOIL				X				X		X		X
041M130101	SOIL				X				X		X		X
041M5A0501	SOIL				X				X		X		X
Total Billable Samples (Water/Soil)		4	0	0	12	2	0	0	12	2	12	2	12

LVOA = CLP Low Volatiles
VOA = CLP Volatiles
LSV = CLP Low Semivolatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results.

SDG # 041M10

A validation was performed on the Volatile Data from SDG 041M10, low concentration. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, FM505, contained compounds with %Ds greater than 25%, but less than 50%, and RRF less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

041W130101	acetone
041W5A0501	2-butanone
040TM01601	
041TM00401	

The continuing calibration, FM295, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040TM01601	methylene chloride
041TM00401	

Method Blank

Associated blank	Compound	Concentration
VBLKFQ	acetone	5

Samples	Compound	Qualification
041W130101	acetone	U
041W5A0501		

Trip Blank

Associated blank	Compound	Concentration
041TM00401	methylene chloride	8

Samples	Compound	Qualification
041W130101 041W5A0501	methylene chloride	U

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W130101 041W5A0501 040TM01601 041TM00401	acetone 2-butanone	+/-	J/R
040TM01601 041TM00401	methylene chloride	+	J
041W130101 041W5A0501	acetone	+	U
041W130101 041W5A0501	methylene chloride	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # 041M10

A validation was performed on the Volatile Data from SDG 041M10. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibrations
	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria.

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated(UJ).

041M5A0501RE chlorobenzene-d_5

Internal Standards (continued)

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated(UJ).

040MZ31901	chlorobenzene-d_5
041M5A0501	bromochloromethane
041MZ31901RE	1,4-difluorobenzene
	chlorobenzene-d_5

Method Blank

Associated blank	Compound	Concentration
VBLKCW	methylene chloride	2J
VBLKCX	methylene chloride	4J
VBLKCY	methylene chloride	4J
VBLKCA	methylene chloride	2J

Samples	Compound	Qualification
040MZ31501 040MZ32301 040M32001 040M32201 040MZ32301	methylene chloride	CRQL
040MZ32101 041M10A301 041M130101 041M5A501RE 040M32401 040MZ31901 040MZ31901RE	methylene chloride	U

Trip Blank

Associated blank	Compound	Concentration
040TM01601	methylene chloride Acetone	7 23
041TM00401	acetone	10

Samples	Compound	Qualification
040MZ32201 040MZ32401	acetone	CRQL
040MZ32301 040NZ32301 040MZ31901 040MZ31901RE 040MZ32001 041M10A301 041M130101 041M5A0501 041M5A0501RE	acetone	U
040MZ31301	methylene chloride	CRQL

Compound Identification /Quantitation

Reject samples 041M5A0501 and 040MZ31901RE, in favor of 041M5A0501RE and 040MZ31901, due to non compliant internal standard area recoveries.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ31901	All associated analytes chlorobenzene-d_5	+/-	J/UJ
040MZ31501 040MZ32301 040M32001 040M32201 040MZ32301	methylene chloride	+	CRQL
040MZ32101 041M10A301 041M130101 041M5A501RE 040M32401 040MZ31901	methylene chloride	+	U
040MZ32201 040MZ32401	acetone	+	CRQL
040MZ32301 040NZ32301 040MZ31901 040MZ32001 041M10A301 041M130101 041M5A0501RE	acetone	+	U
040MZ31301	methylene chloride	+	CRQL
041M5A0501 040MZ31901RE	All analytes	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, OLC01.0 10/92; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 041M10

A validation was performed on the Semivolatile Data from SDG 041M10, low concentration. The data was evaluated based on the following parameters.

*	•	Data Completeness
	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Holding Times

The following water sample, 041W130101, exceeded the method holding time of 7 days by 10 days. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

Continuing Standards (continued)

Specific Finding:

The continuing calibration, DJ132, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

041W130101 3-nitroaniline

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that none of the data requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W130101	All analytes	+/-	J/UJ
041W130101	3-nitroaniline	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, OLC01.0 10/92; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 041M10

A validation was performed on the Semivolatile Data from SDG 041M10. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds did not met requirements for RRFs and %D. Qualifications are required.

Continuing Standards (continued)

Specific Finding:

The continuing calibration, DI973, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

041MZ32401	carbazole

The continuing calibration, DI973, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

041MZ32401	fluorene benzo(b)fluoranthene

The continuing calibration, JF804, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

041M10A301	di-n-octylphthalate
041M130101	
041M5A0501	
040MZ31501	
040MZ31901	
040MZ32001	
040MZ32101	
040MZ32201	
040MZ32301	
040NZ32301	

Continuing Standards (continued)

Specific Finding:

The continuing calibration, JF804, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

040MZ31501	bis(2-ethylhexyl)phthalate
040MZ31901	
040MZ32001	
040MZ32101	
040MZ32201	
040MZ32301	
040NZ32301	
041M10A301	
041M130101	
041M5A0501	

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that none of the data requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041MZ32401	carbazole	+/-	J/UJ
041MZ32401	fluorene benzo(b)fluoranthene	+	J
041M10A301 041M130101 041M5A0501 040MZ31501 040MZ31901 040MZ32001 040MZ32101 040MZ32201 040MZ32301 040NZ32301	di-n-octylphthalate	+/-	J/UJ
040MZ31501 040MZ31901 040MZ32001 040MZ32101 040MZ32201 040MZ32301 040NZ32301 041M10A301 041M130101 041M5A0501	bis(2-ethylhexyl)phthalate	+	J

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QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results this report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.8 Method; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 041M10

A validation was performed on the Pesticide/Aroclor Data from SDG 041M10. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Surrogate Recoveries

Nine (9) samples required qualification due to non-compliant surrogate recoveries. One (1) of the samples exhibited recoveries below 10%.

Specific Findings

The following sample exhibited surrogate recoveries below 10%. All positive results are qualified as estimated, J, and all non-detect results are rejected, R.

041W130101

Surrogate Recoveries, continued

Specific Findings, continued

The following samples exhibited TCMX recoveries below the QC limit. All positive and non-detect results reported in the sample are qualified as estimated, J/UJ.

040MZ31301
040MZ32001
040MZ32101
041MZ32201
041MZ32401
040NZ32301
041M130101
041M5A0501

Field Duplicates

The field duplicate pair of sample 040MZ32301/040NZ32301 exhibited non-compliant precision results for the two (2) compounds reported above the compound CRQLs.

Specific Finding

The noted compounds in the following field duplicate pair exhibited non-compliant field duplicate precision. The reported positive results are qualified as estimated, J.

040MZ32301	4,4'-DDE
040NZ32301	AR1260

Compound Identification/Quantitation

Several reported results exhibited P flags due to column quantitation %Ds greater than 25%. Single component compounds in samples with reported aroclors should be considered suspect. The Form Is submitted by the laboratory indicated incorrect Concentrated Final Volumes for all samples. The laboratory indicated that the software limitation would not accommodate the correct final volume. The samples were to be calculated based on a final volume of 1.0 ml. Based on this information, calculation verification was possible. Supporting documentation explaining the discrepancy has been received. One sample required dilution to accurately quantitate target compounds.

Compound Identification, continued

Specific Findings

All positive results exhibiting P flags are qualified as estimated, J, due to column quantitation %Ds greater than 25%.

For the following sample, the compounds AR1260 and 4,4'-DDE are reported from the dilution analysis. All other compounds in the dilution analysis are rejected, UR.

041M5A0501

Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 5% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W130101	All compounds	+/-	J/R
040MZ31301 040MZ32001 040MZ32101 041MZ32201 041MZ32401 040NZ32301 041M130101 041M5A0501	All compounds	+/-	J/UJ
040MZ32301 040NZ32301	4,4'-DDE AR1260	+	J
041M5A0501	AR1260 4,4'-DDE	+	R
041M5A0501DL	All except D flagged corrsponding results	+/-	UR
All	All P flagged results	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 041M10

A validation was performed on the Metals Data from SDG 041M10. The data was evaluated based on the following parameters.

- * Data Completeness
- * Holding Times -
- * Calibrations -
- Blanks -
- * Interferences -
- Matrix Spike Recovery -
- Matrix Duplicates
- Field Duplicates
- * Laboratory Control Samples -
- * Serial Dilutions
- MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Calcium	3.06 mg/kg	no impact
Thallium	3.42 ug/l	no impact

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Sodium	-21.0 mg/kg	no impact
Beryllium	-1.33 ug/l	all water samples
Iron	-6.16 ug/l	no impact
Potassium	-144. ug/l	no impact
Sodium	-81.1 ug/l	no impact

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

Tha Matrix Spike recovery for soils for Antimony was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

The Matrix Spike recoveries for soils for Selenium, Thallium and Silver were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate Analysis

Specific Finding

The Duplicate analyses for soils for Calcium and Lead were outside the control limits. All positive results are qualified as estimated, "J". The RPDs for Aluminum and Copper were below 35% and will not be qualified. The field duplicate for Calcium was greater than 50%. All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ31501	84
Antimony	040MZ31901	52
Antimony	040MZ32001	66
Antimony	040MZ32101	71

Antimony	041MZ32201	67
Antimony	041MZ32301	62
Antimony	041NZ32301	70

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all water samples	Be.	+/U	J/UJ
all soil samples	Sb.	+	J
		U	R
all soil samples	Se, Ag and Tl.	+/U	J/UJ
all soil samples	Ca and Pb.	+	J
040MZ31501, 901, 32001, 32101, 201, 301 and NZ32301.	Sb.	+/U	J/UJ
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	EM0040
Date:	March 12, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	November 30 - December 1, 1995
Number of Samples:	7 Aqueous Sample(s) with 1 MS/MSD(s) 10 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level III
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Low Concentration Volatiles, Volatiles, Low Concentration Semivolatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Jefferson

Eugene M. Watson, Vice President

3-13-96

Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# EM0040

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	LVOA		VOA		LSV		SV		P/P		TAL/C	
040EM00401	WATER	X				X				X		X	
040FM00401	WATER	X				X				X		X	
040TM01901	WATER	X											
041W030101	WATER	X				X				X		X	
041R030101	WATER	X				X				X		X	
041W030201	WATER	X				X				X		X	
041TM00701	WATER	X											
040MZ30401	SOIL				X				X		X		X
040MZ30601	SOIL				X				X		X		X
040MZ30801	SOIL				X				X		X		X
040MZ31401	SOIL				X				X		X		X
040MZ31701	SOIL				X				X		X		X
040MZ41801	SOIL				X				X		X		X
040MZ42401	SOIL				X				X		X		X
041M030101	SOIL				X				X		X		X
041N030101	SOIL				X				X		X		X
041M030201	SOIL				X				X		X		X
Total Billable Samples	(Water/Soil)	7	0	0	10	5	0	0	10	5	10	5	10

LVOA= CLP Low Volatiles
VOA= CLP Volatiles
LSV= CLP Low Semivolatiles
SV= CLP Semivolatiles
P/P= CLP Pesticide w/PCB's
TAL/CN= CLP Metals w/Cyanide

DATA-ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # EM0040

A validation was performed on the Volatile Data from SDG EM0040. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, FM602, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

041R030101	acetone 2-butanone

The continuing calibration, FM622, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

041W030101 041W030201	acetone 2-butanone 2-hexanone

Method Blanks

Associated blank	Compound	Conc.	Action Level
VBLKFW	acetone	6	60

Samples	Compound	Qualification
041W030101 041W030201 041R030101	acetone	U

Trip Blanks

Associated blank	Compound	Conc.	Action Level
041TM00701	methylene chloride	6	60
	acetone	17	170

Samples	Compound	Qualification
041W030201	methylene chloride	U

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041R030101	acetone 2-butanone	+/-	J/R
041W030101 041W030201	acetone 2-butanone 2-hexanone	+/-	J/R
041W030101 041W030201 041R030101	acetone	+	U
041W030201	methylene chloride	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results.

SDG #EM0040

A validation was performed on the Volatile Data from SDG EM0040. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibrations
	•	Internal Standard Performance
	•	Blanks
	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria.

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated(UJ).

041M030201 chlorobenzene-d_5

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKCY	Methylene chloride	4J	40
VBLKCZ	methylene chloride	2J	20
VBLKCA	methylene chloride	2J	20

Samples	Compound	Qualification
040MZ30601 040MZ30801 040MZ30401 040MZ31401 040MZ31701 040MZ31801 040MZ41201 041M030101 041M030201	methylene chloride	CRQL

Trip Blank

Associated blank	Compound	Concentration	Action Level
040TM01901	acetone	26B	260
	Methylene chloride	2	20

Samples	Compound	Qualification
041M030101 041NZ030101 041M030201 040MZ30401 040MZ31801	acetone	U

Trip Blank (continued)

Samples	Compound	Qualification
040MZ30801 040MZ31401 040MZ31701	acetone	CRQL
041N030101	methylene chloride	CRQL

Surrogates

All of the surrogate recoveries for these samples were not within QA/QC limits.

Specific Finding:

Sample listed below exhibited high recoveries for toluene-d_8. Qualify all positive results as estimated (J).

041M030201

Compound Identification /Quantitation

Reject sample 041M030201RE, in favor of the initial analysis, due to non compliant surrogate recoveries.

System Performance and Overall Assessment

The overall system performance was fair. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041M030201	All associated analytes chlorobenzene-d_5	+/-	J/UJ
040MZ30601 040MZ30801 040MZ30401 040MZ31401 040MZ31701 040MZ31801 040MZ41201 041M030101 041M030201	methylene chloride	+	CRQL
041M030101 041NZ030101 041M030201 040MZ30401 040MZ31801	acetone	+	U
040MZ30801 040MZ31401 040MZ31701	acetone	+	CRQL
041N030101	methylene chloride	+	CRQL
041M030201	all analytes	+	J
041M030201RE	all analytes	+/-	R

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QL denotes the qualifier used by the data validation firm
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\- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, OlC01.0 10/92; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # EM0040

A validation was performed on the Semivolatile Data from SDG EM0040. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Method Blanks

Associated blank	Compound	Conc.	Action Level
041EM00201	bis(2-ethylhexyl) phthalate	2J	20

Samples	Compound	Qualification
041R030101	bis(-ethylhexyl)phthalate	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041R030101	bis(-ethylhexyl)phthalate	+	CRQL

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QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # EM0040

A validation was performed on the Semivolatile Data from SDG EM0040. The data was evaluated based on the following parameters.

*	•	Data Completeness
	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
	•	Internal Standard Performance
	•	Blanks
	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Holding Times

The following samples had extractions that exceeded the method criteria of fourteen (14) days from date sampled. Samples exceeded the holding time by thirteen (13) and fifteen (15) days. Qualifications are required.

Specific Find:

040MZ30601 exceeded holding time by fifteen (15) days and sample 040MZ30801 exceeded holding time by thirteen (13) days. Qualify all positive results as estimated (J) and non detects as estimated (UJ).

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Specific Finding:

The continuing calibration, DJ216, contained compounds with %Ds greater than 25% an less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

041N030101	pyrene (37.9%)
	Chrysene (27.0%)
	Benzo(k)fluoranthene (33.6%)

The continuing calibration, DJ216, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

041N030101	4-chloroaniline (54.9%)
	3-nitroaniline (78.8%)
	2,4-dinitrophenol (51.2%)
	4-nitroaniline (74.1%)
	Bis(2-ethylhexyl)phthalate (55.9%)
	Di-n-octyl phthalate (54.2%)

The continuing calibration, IF760, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ30401	hexachlorocyclopentadiene (50.6%)
041M030101	

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, IF760, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

040MZ30401 4-chloroaniline (218.2%)
041M030101

The continuing calibration, IF723, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

041M030201 4-chloroaniline (230.1%)

The continuing calibration, IF780, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ31401 hexachlorocyclopentadiene (68.4%)
040MZ31701

The continuing calibration, IF723, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

040MZ31401 4-chloroaniline (190.9%)
040MZ31701

The continuing calibration, AJ074, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ41801 4,6-dinitro-2-methylphenol (63.2%)

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, IF723, contained compounds with RRF less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

040MZ41801 2,4-dinitrophenol (0.034)
040MZ42401

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria.

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated(UJ).

040MZ31401 perylene-d_{12}
040MZ31701

Method Blanks

Associated blank	Compound	Concentration	Action Level
SBLKII	bis(2ethylhexyl)phthalate	45J	450
SBLKAM	bis(2ethylhexyl)phthalate	48J	480
SBLKDL	bis(2ethylhexyl)phthalate	37J	370
SBLKJO	bis(2ethylhexyl)phthalate	90J	900

Method Blanks (continued)

Samples	Compound	Qualification
040MZ31401 040MZ31701 041M030101 040MZ42401 040MZ41801 041N030101	bis(2ethylhexyl)phthalate	CRQL
040MZ30801	bis(2ethylhexyl)phthalate	U

Field Blanks

Associated blank	Compound	Concentration	Action Level
040FM00401	bis(2ethylhexyl)phthalate	1J	10

Samples	Compound	Qualification
040MZ30601	bis(2ethylhexyl)phthalate	CRQL

Surrogates

All of the surrogate recoveries for these samples were not within QA/QC limits.

Specific Finding:

Sample listed below exhibited low recoveries for 2-fluorophenol and 2,4,6-tribromophenol. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

041N030101 (15%, 18%)

Compound Identification /Quantitation

Specific Finding:

Reject samples 040MZ31701RE and 040MZ31401RE, in favor of the initial analysis, due to non compliant internal standard areas.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 10% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ30601 040MZ30801	All analytes	+/-	J/UJ
041N030101	pyrene (37.9%) Chrysene (27.0%) Benzo(k)fluoranthene (33.6%)	+	J
041N030101	4-chloroaniline (54.9%) 3-nitroaniline (78.8%) 2,4-dinitrophenol (51.2%) 4-nitroaniline (74.1%) Bis(2-ethylhexyl)phthalate (55.9%) Di-n-octyl phthalate (54.2%)	+/-	J/UJ
040MZ30401 041M030101	hexachlorocyclopentadiene (50.6%)	+/-	J/UJ
040MZ30401 041M030101	4-chloroaniline (218.2%)	+/-	J/R
041M030201	4-chloroaniline (230.1%)	+/-	J/R
040MZ31401 040MZ31701	hexachlorocyclopentadiene (68.4%)	+/-	J/UJ
040MZ31401 040MZ31701	4-chloroaniline (190.9%)	+/-	J/R
040MZ41801	4,6-dinitro-2-methylphenol (63.2%)	+/-	J/UJ
040MZ41801 040MZ42401	2,4-dinitrophenol (0.034)	+/-	J/R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ31401 040MZ31701	All associated analytes perylene-d_{12}	+/-	J/UJ
040MZ31401 040MZ31701 041M030101 040MZ42401 040MZ41801 041N030101	bis(2ethylhexyl)phthalate	+	CRQL
040MZ30801	bis(2ethylhexyl)phthalate	+	U
040MZ30601	bis(2ethylhexyl)phthalate	+	CRQL
041N030101	All analytes	+/-	J/UJ
040MZ31701RE 040MZ31401RE	All analytes	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EM0040

A validation was performed on the Pesticide/Aroclor Data from SDG EM0040. The data was evaluated based on the following parameters:

*	•	Data Completeness
	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Holding Times

The analysis holding times were exceeded for many samples.

Holding Times, Continued

Specific Findings

The following samples exceeded the analysis holding time by one (1) to four (4) days. It is the professional opinion of the data validator that the positive results should be qualified as estimated, J.

040MZ30401
040MZ30401DL
040MZ30601
040MZ30801
040MZ31401
040MZ31701
040MZ41801
041M030101
041N030101
041M030101DL
041N030101DL
041M030201
041W030201
041M030201DL

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptably linear for all compounds.

Specific Findings

The initial calibration of 1/11/96 contained compounds with %RSDs greater than 20%. For the samples and the non-compliant compound listed below, all positive results are qualified as estimated, J, and all non-detect results are qualified as estimated, UJ.

All samples	Alpha-BHC (20.2%/21.0%)
	Delta-BHC (21.2%/21.1%)

Surrogate Recoveries

Several samples exhibited non-compliant TCX and/or DCB recoveries.

Specific Finding

The sample listed below exhibited a TCX recovery below 10%. The positive results are qualified as estimated, J, and the non-detect results are rejected, R.

Sample ID	Surrogate	% Recovery
041W030201	TCX-1	8%

The sample listed below exhibited a high DCB recovery. The positive results are qualified as estimated, J.

Sample ID	Surrogate	% Recovery
040MZ30401	DCB-1	282%

Field Duplicates

The field duplicate pair of samples 041M030101 and 041N030101 exhibited positive results and non-compliant RPDs for several target compounds. Three (3) compounds required qualification due to poor duplicate precision.

Specific Finding

The field duplicate pair of samples 041M030101 and 041N030101 exhibited positive results and non-compliant RPDs for three (3) compounds. For the compounds listed below, the positive results are qualified as estimated, J, due to poor duplicate precision.

041M030101	Delta-BHC (72%)
041N030101	4,4'-DDE (67%)
	4,4'-DDT (110%)

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

Analyte Identification/Quantitation

Four (4) samples required dilution to accurately quantitate target compounds. Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

For the following samples and compounds, the results from the original analysis are replaced with the corresponding results from the dilution analysis. All other results from the dilution are rejected, UR, in favor of the results reported from the undiluted analysis.

040MZ30401	Dieldrin Alpha Chlordane
041M030101 041N030101	4,4'-DDE 4,4'-DDD 4,4'-DDT
041M030201	Aroclor 1260 4,4'-DDD

The positive results reported in all samples which exhibited column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 30% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ30401 040MZ30401DL 040MZ30601 040MZ30801 040MZ31401 040MZ31701 040MZ41801 041M030101 041N030101 041M030101DL 041N030101DL 041M030201 041W030201 041M030201DL	ALL	+	J
All samples	Alpha-BHC Delta-BHC	+/-	J/UJ
041W030201	ALL	+/-	J/R
040MZ30401	ALL	+	J
041M030101 041N030101	Delta-BHC 4,4'-DDE 4,4'-DDT	+	J
040MZ30401	Dieldrin Alpha Chlordane	+	D
041M030101 041N030101	4,4'-DDE 4,4'-DDD 4,4'-DDT	+	D
041M030201	Aroclor 1260 4,4'-DDD	+	D

SUMMARY OF DATA QUALIFICATIONS, Continued

SAMPLE ID	ANALYTE ID	DL	QL
040MZ30401DL 041M030101DL 041N030101DL 041M030201DL	ALL OTHERS	+/-	UR
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EM0040

A validation was performed on the Metals Data from SDG EM0040. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
	•	Field Duplicates
*	•	Laboratory Control Samples
	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Calcium	6.25 mg/kg	no impact
Iron	9.25 mg/kg	no impact
Lead	0.11 mg/kg	all soil samples below 0.55 mg/kg
Iron	4.28 ug/l	no impact

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Barium	-0.13 mg/kg	all soil samples below 1.3 mg/kg
Copper	-0.49 mg/kg	all soil samples below 4.9 mg/kg
Potassium	-20.3 mg/kg	all soil samples below 203 mg/kg
Silver	-0.42 mg/kg	all soil samples below 4.2 mg/kg
Barium	-1.81 ug/l	all water samples below 18.1 ug/l
Potassium	-152 ug/l	all water samples below 1520 ug/l
Selenium	-3.26 ug/l	all water samples below 32.6 ug/l
Zinc	-5.32 ug/l	all water samples below 53.2 ug/l

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recoveries for soils for Antimony (52%), Cadmium (74%), Selenium (74%), Silver (64%) and Thallium (65%) and for waters for Antimony (65%) were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Field Duplicate Analysis

Specific Finding

The field duplicate analyses for soils for Aluminum, Iron, Magnesium, Manganese, Vanadium and Zinc were above 50% and will be qualified as estimated, "J".

Serial Dilution

Specific Finding

The Serial Dilutions for soils for Lead and Calcium were outside the control limits. All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	041R030101	61
Antimony	041W030201	65
Antimony	040MZ30601	79
Antimony	041M030201	53
Antimony	040MZ30801	83

The post digestion spike recovery for GFAA was above the upper control limits. All positive results for the listed samples below are qualified as estimated, "J".

Element	Sample IDs	% recoveries
Antimony	040EM00401	122
Antimony	040MZ30401	125

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All soil samples below 0.55 mg/kg	Pb.	+	U
all soil samples below 1.3 mg/kg	Ba.	+/U	J/UJ
all soil samples below 4.9 mg/kg	Cu.		
all soil samples below 203 mg/kg	K.		
all soil samples below 4.2 mg/kg	Ag.		
all water samples below 18.1 ug/l	Ba.		
all water samples below 1520 ug/l	K.		
all water samples below 32.6 ug/l	Se.		
all water samples below 53.2 ug/l	Zn.		
allsoil samples	Sb, Cd, Se, Ag and Tl.	+/U	J/UJ
all water samples	Sb.		
all soil samples	Al, Fe, Mg, Mn, V and Zn.	+	J
all soil samples	Pb and Ca.	+	J
041R030101, 041W030201, 040MZ30601, 040MZ31401, 041M030201 and 040MZ30801.	Sb.	+/U	J/UJ
040EM00401 and 040MZ30401.	Sb.	+	J
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	EM0100
Date:	April 10, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	NAS Pensacola
Date Sampled:	January 25 - 26, 1996
Number of Samples:	4 Aqueous Sample(s) with 0 MS/MSD(s) 16 Non-aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively with Region IV Modifications
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Low Concentration Volatiles, Volatiles, semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig H. Simpson

Eugene M. Watson, Vice President

5-3-96

Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# EM0100

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	LVOA		VOA		SV		P/P		TAL/CN	
040MZ11401	SOIL				X		X		X		X
040MZ11501	SOIL				X		X		X		X
040MZ11601	SOIL				X		X		X		X
040MZ11701	SOIL				X		X		X		X
040MZ11801	SOIL				X		X		X		X
040MZ11901	SOIL				X		X		X		X
040MZ12001	SOIL				X		X		X		X
040MZ12101	SOIL				X		X		X		X
040EM01001	WATER	X				X		X		X	
040FM01001	WATER	X				X		X		X	
040MZ12201	SOIL						X		X		X
040MZ12301	SOIL						X		X		X
040MZ12401	SOIL						X		X		X
040MZ12501	SOIL						X		X		X
040MZ12601	SOIL						X		X		X
040MZ12701	SOIL						X		X		X
040MZ12801	SOIL						X		X		X
040MZ12901	SOIL						X		X		X
040TM03701	WATER	X									
040MZ03601	WATER	X									
Total Billable Samples	(Water/Soil)	4	0	0	8	2	16	2	16	2	16

LVOA = CLP Low Concentration Volatiles
VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG #EM0100

A validation was performed on the Volatile Data from SDG EM0100. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, GD599, contained compounds with average RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

040MZ03601	acetone (0.017) 2-butanone (0.025)

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKFW	acetone	9	90

Samples	Compound	Qualification
040MZ03601	acetone	U

Trip Blank

Associated blank	Compound	Concentration	Action Level
040TM03701	methylene chloride	3	30

Samples	Compound	Qualification
040MZ03601	methylene chloride	U

System Performance and Overall Assessment

The overall system performance was fair. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ03601	acetone 2-butanone	+/-	J/R
040MZ03601	acetone	+	U
040MZ03601	methylene chloride	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG #EM0100

A validation was performed on the Volatile Data from SDG EM0100. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibrations
	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria. Qualifications are required.

Internal Standards (continued)

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated (UJ).

040MZ11401	chlorobenzene-d_5
040MZ11601	
040MZ11501RE	
040MZ11801RE	
040MZ11801	1,4-difluorobenzene
040MZ11601RE	chlorobenzene-d_5
040MZ12001RE	
040MZ11501	bromochloromethane
040MZ11901	1,4-difluorobenzene
040MZ12001	Chlorobenzene-d_5
040MZ11401RE	
040MZ11901RE	

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKGN	Methylene chloride	3J	30
	acetone	4J	40

Method Blank (continued)

Samples	Compound	Qualification
040MZ11401RE 040MZ11501RE 040MZ11601RE 040MZ11801RE 040MZ11901RE 040MZ12001RE	methylene chloride	CRQL
040MZ12101	acetone	CRQL

Trip Blank

Associated blank	Compound	Concentration	Action Level
040TM03701	methylene chloride	3	30
	Acetone	10	100

Samples	Compound	Qualification
040MZ11401	acetone	U
040MZ11501 040MZ11801 040MZ12001	methylene chloride	CRQL

Compound Identification /Quantitation

Reject samples 040MZ11401RE, 040MZ11601RE, and 040MZ11901RE, in favor of the initial analysis, due to non compliant internal standard area recoveries.

Reject samples 040MZ11501, 040MZ11801, and 040MZ12001, in favor of the reanalysis, due to non compliant internal standard area recoveries.

System Performance and Overall Assessment

The overall system performance was fair. The data reviewer estimates that less than 10% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
	All associated analytes	+/-	J/UJ
040MZ11401	chlorobenzene-d_5		
040MZ11601			
040MZ11501RE			
040MZ11801RE			
040MZ11801	1,4-difluorobenzene		
040MZ11601RE	chlorobenzene-d_5		
040MZ12001RE			
040MZ11501	bromochloromethane		
040MZ11901	1,4-difluorobenzene		
040MZ12001	Chlorobenzene-d_5		
040MZ11401RE			
040MZ11901RE			
040MZ11401RE	methylene chloride	+	CRQL
040MZ11501RE			
040MZ11601RE			
040MZ11801RE			
040MZ11901RE			
040MZ12001RE			
040MZ11501			
040MZ11801			
040MZ12001			
040MZ12101	acetone	+	CRQL
040MZ11401	acetone	+	U
040MZ11401RE	all results	+/-	R
040MZ11601RE			
040MZ11901RE			
040MZ11501			
040MZ11801			
040MZ12001			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # EM0100

A validation was performed on the Semivolatile Data from SDG EM0100. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, IG222, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

040MZ12201	4-chloroaniline (-230.1)
040MZ12301	

The continuing calibration, IG238, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

040MZ12701	4-chloroaniline (-209.8)
040MZ12501	
040MZ12601	
040MZ12101	
040MZ11701	
040MZ11801	
040MZ12901	
040MZ11401	
040MZ11501	
040MZ11601	
040MZ11901	
040MZ12001	

Method Blanks

Associated blank	Compound	Conc.	Action Level
SBLKIA	bis(2-ethylhexyl) phthalate	53J	530
SBLKAY	bis(2-ethylhexyl) phthalate	40J	400

Method Blanks (continued)

Samples	Compound	Qualification
040MZ11801	bis(2-ethylhexyl) phthalate	CRQL
040MZ11901		
040MZ12001		
040MZ12101		
040MZ12201		
040MZ12301		
040MZ12601		
040MZ12801		

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ12201 040MZ12301	4-chloroaniline (-230.1)	+/-	J/R
040MZ12701 040MZ12501 040MZ12601 040MZ12101 040MZ11701 040MZ11801 040MZ12901 040MZ11401 040MZ11501 040MZ11601 040MZ11901 040MZ12001	4-chloroaniline (-209.8)	+/-	J/R
040MZ11801 040MZ11901 040MZ12001 040MZ12101 040MZ12201 040MZ12301 040MZ12601 040MZ12801	bis(2-ethylhexyl) phthalate	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EM0100

A validation was performed on the Pesticide/Aroclor Data from SDG EM0100. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
	•	GC Performance
	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

GC Instrument Performance

Several PEM %Ds were above the QC limit.

GC Instrument Performance, Continued

Specific Findings

PEM0F/PEM1F (2/22/96 16:25) exhibited %Ds greater than 25%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

040MZ12701	4,4'-DDT (-29.0%/-28.0%)
040MZ12801	Methoxychlor (-26.4%/-26.4%)
040MZ11401	
040MZ11801	
040MZ12101	
040MZ12201	
040MZ12301	
040MZ12401	
040MZ12501	
040MZ12901	
040MZ12601	
040MZ11601	
040MZ11701	
040MZ11901	

Continuing Calibrations

One (1) continuing calibration standard exhibited %Ds above the QC limits.

Continuing Calibrations, Continued

Specific Finding

The continuing calibration of 02/22/96 04:13 exhibited %Ds greater than 25%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

040MZ12701	4,4'-DDT (-32.8%/-34.0%)
040MZ12801	Methoxychlor (-27.5%)
040MZ11401	
040MZ11801	
040MZ12101	
040MZ12201	
040MZ12301	
040MZ12401	
040MZ12501	
040MZ12901	
040MZ12601	
040MZ11601	
040MZ11701	
040MZ11901	

Surrogate Recoveries

Several samples did not exhibit TCX recoveries.

Specific Finding

The samples listed below exhibited 0% TCX recoveries. The positive results are qualified as estimated, J, and the non-detect results are rejected, R.

Sample ID	Surrogate	% Recovery
040MZ11501	TCX-1	0%
040MZ12001	TCX-1	0%

Analyte Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 30% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ12701	4,4'-DDT	+/-	J/UJ
040MZ12801	Methoxychlor		
040MZ11401			
040MZ11801			
040MZ12101			
040MZ12201			
040MZ12301			
040MZ12401			
040MZ12501			
040MZ12901			
040MZ12601			
040MZ11601			
040MZ11701			
040MZ11901			
040MZ12701	4,4'-DDT	+/-	J/UJ
040MZ12801	Methoxychlor		
040MZ11401			
040MZ11801			
040MZ12101			
040MZ12201			
040MZ12301			
040MZ12401			
040MZ12501			
040MZ12901			
040MZ12601			
040MZ11601			
040MZ11701			
040MZ11901			
040MZ11501	ALL	+/-	J/R
040MZ12001			
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EM0100

A validation was performed on the Metals Data from SDG EM0100. The data was evaluated based on the following parameters.

*	•	Data Completeness
	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	2.31 mg/kg	no impact
Calcium	7.98 mg/kg	no impact
Iron	1.32 mg/kg	no impact
Sodium	14.9 mg/kg	no impact

The Field blanks exhibited contamination for the following elements

Elements	Conc.	Samples affected
Barium	41.1 ug/l	all soil samples below 20.6 mg/kg
Cobalt	4.8 ug/l	all soil samples below 2.4 mg/kg
Thallium	4.9 ug/l	all soil samples below 2.45 mg/kg
Zinc	38.7 ug/l	all soil samples below 19.4 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited more contamination but had no impact on the data.

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony (26%) was below 30%. All non-detect results are rejected and all positive results are qualfied as estimated, "J".

Laboratory Duplicate Analysis

Specific Findings

The Duplicate analysis for Calcium (145%) was greater than 35%. All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits (<85% BUT >10%). All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ11401	76
Antimony	040MZ11501	53
Antimony	040MZ11701	71
Antimony	040MZ11801	52
Antimony	040MZ11901	68
Antimony	040MZ12001	57
Antimony	040MZ12101	48
Antimony	040MZ12201	60
Antimony	040MZ12301	63
Antimony	040MZ12401	69

Antimony	040MZ12601	78
Antimony	040MZ12701	58
Antimony	040MZ12901	80

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

Holding Times

For samples 040MZ11901, 12001 and 12101, the holding times were violated by fourteen days for Cyanide. All non-detect results are rejected.

* The laboratory failed to submit form 14s for the ICP and GFAA raw data.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 20.6 mg/kg	Ba.	+	U
all soil samples below 2.4 mg/kg	Co.		
all soil samples below 2.45 mg/kg	Tl.		
all soil samples below 19.4 mg/kg	Zn.		
all soil samples	Sb.	+	J
		U	R
all soil samples	Ca.		
040MZ11401, 11501, 11701, 11801, 11901, 12001, 12101, 12201, 12301, 12401, 12601, 12701 and 12901.	Sb.	+/U	J/UJ
040MZ11901, 12001 and 12101.	Cn.	U	R
All "B" results	all analytes	B	J

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Data Validation Report

SDG#:	EMD060
Date:	March 22, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	December 13 - 15, 1995
Number of Samples:	9 Aqueous Sample(s) with 0 MS/MSD(s) 12 Non-aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level III
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Low Concentration Volatiles, Semivolatiles, Low Concentration Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Seerfoss
Eugene M. Watson, Vice President

3-25-96
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# EMD060

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		LVOA		SV		LSV		P/P		TAL/CN	
040EM00601	WATER	X				X				X		X	
040FM00601	WATER	X				X				X		X	
040MZ24101	SOIL		X				X				X		X
040MZ24201	SOIL		X				X				X		X
040MZ274401	SOIL		X				X				X		X
040MZ24501	SOIL		X				X				X		X
040MZ24601	SOIL		X				X				X		X
040MZ24701	SOIL		X				X				X		X
040MZ24801	SOIL		X				X				X		X
040MZ24901	SOIL		X				X				X		X
041M18A101	SOIL		X				X				X		X
041M18A201	SOIL		X				X				X		X
041M18A301	SOIL		X				X				X		X
041M18B101	SOIL		X				X				X		X
040TM02601	WATER			X									
041W18A201	WATER			X				X		X		X	
041W18B101	WATER			X				X		X		X	
041EM00401	WATER			X				X		X		X	
041FM00401	WATER			X				X		X		X	
041TM01301	WATER			X									
041TM01401	WATER			X									
Total Billable Samples (Water/Soil)		2	12	7	0	2	12	4	0	6	12	6	12

VOA = CLP Volatiles
LVOA = CLP Low Concentrtion Volatiles
SV = CLP Semivolatiles
LSV = CLP Low Concentration Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and are based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.8 Method; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EMD060

A validation was performed on the Volatile Data from SDG EMD060. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
	•	Internal Standard Performance
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Continuing Calibrations

The continuing calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %Ds. The average RRF requirements were met for all continuing calibration standards.

Continuing Calibrations, continued
Specific Findings

The continuing calibration standard, BU156, contained compounds with %Ds greater than 25% but less than 50%. For the samples and noncompliant compounds listed below, the positive results are qualified as estimated, J.

041M18A301 041M18B101	acetone (25.7%)
041M18A301 041M18B101	2-butanone (33.0%)
040MZ24201 040MZ24801	methylene chloride (33.4%)

Field QC Blanks

Contamination for methylene chloride was detected in the field QC blanks. The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria.

	040EM00601	**040FM00601**
methylene chloride	58 μg/L	56 μg/L

Field QC Blanks, continued

	Samples	Contaminant	Action Levels	Qualification
040EM00601	040MZ24201 040MZ24501 040MZ24701RE 040MZ24801 040MZ24901	methylene chloride	580 μg/Kg	CRQL
	041M18A101RE			U

Internal Standard Areas

Three (3) samples exhibited noncompliant IS EICP area recoveries.

Specific Findings

The following samples exhibited noncompliant internal standard area recoveries. All associated positive and non-detect results are qualified as estimated, J/UJ.

040MZ24701 041M18A301 040MZ24701RE 041M18A101RE	chlorobenzene-d_5
040M18A101	1,4-difluorobenzene chlorobenzene-d_5
041M18A301RE	All internal standards

Compound Quantitation

Specific Finding

The samples noted below are rejected, UR, in favor of the initial or RE analysis of the sample. The reviewer chose the analysis exhibiting the best IS area recoveries.

041M18A101
040MZ24701RE
041M18A301RE

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 5% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041M18A301 041M18B101	acetone	+	J
041M18A301 041M18B101	2-butanone	+	J
040MZ24201 040MZ24801	methylene chloride	+	J
040MZ24201 040MZ24501 040MZ24701RE 040MZ24801 040MZ24901	methylene chloride	+	CRQL
041M18A101RE	methylene chloride	+	U
040MZ24701 041M18A301 040MZ24701RE 041M18A101RE	All associated with chlorobenzene-d_5	+/-	J/UJ
040M18A101	All associated with 1,4-difluorobenzene chlorobenzene-d_5	+/-	J/UJ
041M18A301RE	All associated with All internal standards	+/-	J/UJ

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041M18A101	ALL	+/-	UR
040MZ24701RE			
041M18A301RE			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # EMD060

A validation was performed on the Volatile Data from SDG EMD060. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, FN006, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

041W18A201	acetone
041W18B101	2-butanone

Method Blanks

Associated blank	Compound	Conc.	Action Level
VBLKFQ	acetone	8	80

Samples	Compound	Qualification
041W18A201	acetone	U
041W18B101		

Trip Blanks

Associated blank	Compound	Conc.	Action Level
041TM01401	methylene chloride	5B	50

Samples	Compound	Qualification
041W18A201	methylene chloride	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W18A201 041W18B101	acetone 2-butanone	+/-	J/R
041W18A201 041W18B101	acetone	+	U
041W18A201	methylene chloride	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # EMD060

A validation was performed on the Semivolatile Data from SDG EMD060. The data was evaluated based on the following parameters.

*	•	Data Completeness
	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Holding Times

The following samples had extractions that exceeded the method criteria of fourteen (14) days from date sampled. Qualifications are required.

Specific Find:

040MZ24401 and 040MZ24501 exceeded holding time by twenty-three (23) days. Qualify all positive results as estimated (J) and non detects as rejected (R).

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Specific Finding:

The continuing calibration, AJ317, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ24501	2,4-dinitrophenol (61.6%)

The continuing calibration, DJ491, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ24701	3-nitroaniline (58.3%)
	2,4-dinitrophenol (59.7%)

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria.

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated (UJ).

041M18A201	perylene-d_{12}

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blanks

Associated blank	Compound	Concentration	Action Level
SBLKDZ	bis(2ethylhexyl)phthalate	61J	610
SBLKAQ	bis(2ethylhexyl)phthalate	86J	860

Samples	Compound	Qualification
040MZ24101	bis(2ethylhexyl)phthalate	CRQL
040MZ24601		
040MZ24701		
040MZ24801		
040MZ24901		
041M18A101		
041M18A201		
041M18A301		
041M18B101		
040MZ24401		
040MZ24501		

Rinseate Blanks

Associated blank	Compound	Concentration	Action Level
040EM00601	diethylphthalate	3J	30

Samples	Compound	Qualification
041M18A101	diethylphthalate	CRQL

Compound Identification /Quantitation

Specific Finding:

Reject sample 041M18A201RE, in favor of the initial analysis, due to non compliant internal standard area recoveries.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ24401 040MZ24501	all analytes	+/-	J/R
040MZ24501	2,4-dinitrophenol	+/-	J/UJ
040MZ24701	3-nitroaniline 2,4-dinitrophenol	+/-	J/UJ
041M18A201	All associated analytes perylene-d_{12}	+/-	J/UJ
040MZ24101 040MZ24601 040MZ24701 040MZ24801 040MZ24901 041M18A101 041M18A201 041M18A301 041M18B101 040MZ24401 040MZ24501	bis(2ethylhexyl)phthalate	+	CRQL
041M18A101	diethylphthalate	+	CRQL
041M18A201RE	all analytes	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, OLC01.0 10/92; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # EMD060

A validation was performed on the Semivolatile Data from SDG EMD060. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Field Blanks

Associated blank	Compound	Conc.	Action Level
041FM00401	bis(2-ethylhexyl) phthalate	9J	90

Samples	Compound	Qualification
041W18A201	bis(2-ethylhexyl) phthalate	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W18A201	bis(2-ethylhexyl) phthalate	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EMD060

A validation was performed on the Pesticide/Aroclor Data from SDG EMD060. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptably linear for all compounds.

Initial Calibrations, Continued

Specific Findings

The initial calibration of 1/20/96 contained compounds with %RSDs greater than 20%. For the samples and the non-compliant compound listed below, all positive results are qualified as estimated, J, and all non-detect results are qualified as estimated, UJ.

040MZ24201	Alpha-BHC (20.6%)
040MZ24601	
040MZ24901	
040MZ24801	
041M18A301	
040MZ24501	
040MZ24101	
040MZ24401	
040MZ24701	
041M18A201	
041M18B101	
041M18A101DL	
041M18A201DL	
041M18A101	
041M18B101DL	

Surrogate Recoveries

Several samples exhibited non-compliant TCX and/or DCB recoveries.

Specific Finding

One (1) sample exhibited a high TCX recovery. For the samples listed below, the positive results are qualified as estimated, J.

Sample ID	Surrogate	% Recovery
040MZ24101	TCX-2	170%

Surrogate Recoveries, Continued

Specific Finding, Continued

Three (3) samples exhibited low TCX or DCB recoveries. For the samples listed below, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

Sample ID	Surrogate	% Recovery
040MZ24401	TCX-1	14%
040EM00601	DCB-1	25%
041FM00401	TCX-1	29%

Two (2) samples exhibited TCX recoveries below 10%. For the samples listed below, the positive results are qualified as estimated, J, and the non-detect results are rejected, R.

Sample ID	Surrogate	% Recovery
041EM00401	TCX-1	3%
	TCX-2	4%
040MZ24201	TCX-1	9%
	TCX-2	25%
	DCB-1	21%
	DCB-2	17%

Analyte Identification/Quantitation

Three (3) samples required dilution to accurately quantitate target compounds. Several samples exhibited column quantitation %Ds greater than 25%.

Analyte Identification/Quantitations, Continued

Specific Findings

For the following samples and compounds, the results from the original analysis are replaced with the corresponding results from the dilution analysis. All other results from the dilution are rejected, UR, in favor of the results reported from the undiluted analysis.

041M18A101	4,4'-DDD
041M18A201	4,4'-DDE
	4,4'-DDT
041M18B101	4,4'-DDT

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 30% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ24201	Alpha-BHC	+/-	J/UJ
040MZ24601			
040MZ24901			
040MZ24801			
041M18A301			
040MZ24501			
040MZ24101			
040MZ24401			
040MZ24701			
041M18A201			
041M18B101			
041M18A101DL			
041M18A201DL			
041M18A101			
041M18B101DL			
040MZ24101	ALL	+	J
040MZ24401	ALL	+/-	J/UJ
040EM00601			
041FM00401			
041EM00401	ALL	+/-	J/R
040MZ24201			
041M18A101	4,4'-DDD	+	D
041M18A201	4,4'-DDE		
	4,4'-DDT		
041M18B101	4,4'-DDT	+	D
041M18A101DL	ALL OTHERS	+/-	UR
041M18A201DL			
041M18B101DL			
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # EMD060

A validation was performed on the Metals Data from SDG EMD060. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	10.1 mg/kg	no impact
Barium	0.21 mg/kg	all soil samples below 1.05 mg/kg
Calcium	14.6 mg/kg	no impact
Iron	5.74 mg/kg	no impact
Lead	0.48 mg/kg	all soil samples below 2.4 mg/kg

Magnesium	4.11 mg/kg	no impact
Potassium	15.4 mg/kg	all soil samples below 77.0 mg/kg
Silver	0.45 mg/kg	no impact
Sodium	6.48 mg/kg	no impact
Zinc	0.82 mg/kg	all soil samples below 4.1 mg/kg
Calcium	117.0 ug/l	no impact
Iron	13.7 ug/l	no impact
Sodium	118.0 ug/l	no impact

The field and equipment blank exhibited contamination for the following elements.

Arsenic	2.1 ug/l	all water non QC samples below 10.5 ug/l
Barium	4.8 ug/l	all water non QC samples below 24.0 ug/l

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Thallium	-0.35 mg/kg	all soil samples below 3.5 mg/kg
Antimony	-2.2 ug/l	all water non QC samples below 22.0 ug/l

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony (45%) was below the lower control limits (<75% but >30%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recovery for Mercury (172%) was abvoe the upper control limits (>125%). All positive results are qualified as estimated, "J".

Laboratory Duplicate Analysis

Specific Finding

The duplicate analysis for Mercury was less than 2 times the CRDL. No qualification is necessary.

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	041M18B101	77
Antimony	041W18A301	52
Antimony	040MZ24101	76
Antimony	040MZ24201	56
Antimony	040MZ24401	54
Antimony	040MZ24801	60
Antimony	040MZ24901	63
Antimony	041M18A101	45
Antimony	040MZ24601	78
Antimony	041M18A201	80
Antimony	041W18B101	41
Antimony	041W18A201	42

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 1.05 mg/kg	Ba.	+	U
all soil samples below 2.4 mg/kg	Pb.		
all soil samples below 77.0 mg/kg	K.		
all soil samples below 4.1 mg/kg	Zn.		
all water samples below 10.5 ug/l	As.		
all water samples below 24.0 ug/l	Ba.		
all soil samples below 3.5 mg/kg	Tl.	+/U	J/UJ
all water sdamples below 22.0 ug/l	Sb.		
all soil samples	Sb.	+/U	J/UJ
all soil samples	Hg.	+	J
041M18B101, 041M18A301, 040MZ24101, 040MZ24201, 040MZ24401, 040MZ24801, 040MZ24901, 041M18A101, 040MZ24601, 041M18A201, 041W18B101 AND 041W18A201.	Sb.	+/U	J/UJ
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	M00901
Date:	March 29, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	January 19 - 22, 1996
Number of Samples:	14 Aqueous Sample(s) with 1 MS/MSD(s) 5 Non-aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Low Concentration Volatiles, Semivolatiles, Low Concentration Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Serfan

Eugene M. Watson, Vice President

4-2-96

Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# M00901

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		LVOA		SV		LSV		P/P		TAL/CN	
RABM000101	SOIL		X				X				X		X
RABM000201	SOIL		X				X				X		X
RABM000301	SOIL		X				X				X		X
041M480101	SOIL		X				X				X		X
041N480101	SOIL		X				X				X		X
040EM00901	WATER			X		X				X		X	
040FM00901	WATER			X		X				X		X	
040TM03501	WATER			X									
RABW000101	WATER			X				X		X		X	
RABW000201	WATER			X				X		X		X	
RABW000301	WATER			X				X		X		X	
041W480101	WATER			X				X		X		X	
041R480101	WATER			X				X		X		X	
041W490301	WATER			X				X		X		X	
041TM01901	WATER			X									
041WW10101	WATER			X				X		X		X	
041WW10201	WATER			X				X		X		X	
041WW10301	WATER			X				X		X		X	
041W490101	WATER			X				X		X		X	
Total Billable Samples	(Water/Soil)	0	5	14	0	2	5	10	0	12	5	12	5

VOA = CLP Volatiles
LVOA = CLP Low Concentration Volatiles
SV = CLP Semivolatiles
LSV = CLP Low Concentration Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # M00901

A validation was performed on the Volatile Data from SDG M00901. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKCB	acetone	4J	40
	Methylene chloride	2J	20

Samples	Compound	Qualification
RABM000101 RABM000201 RABM000301	methylene chloride	CRQL
RABM000201	acetone	U

Trip Blank

Associated blank	Compound	Concentration	Action Level
040TM03501	acetone	59	590
	Methylene chloride	3	30

Samples	Compound	Qualification
041M480101 041N480101	acetone	U
041N480101	methylene chloride	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 10% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
RABM000101 RABM000201 RABM000301	methylene chloride	+	CRQL
RABM000201 041M480101 041N480101	acetone	+	U
041N480101	methylene chloride	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # M00901

A validation was performed on the Volatile Data from SDG M00901. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, EN139, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

RABW000201	acetone
RABW000301	2-butanone
	1,2-dibromo-3-chloropropane

The continuing calibration, FN531, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

RABW000101	acetone
	2-butanone

The continuing calibration, FN571, contained compounds with %Ds that were greater than 50% but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

041W490101	chloromethane (63.9)
041W490301	
041WW10101	
041WW10201	

The continuing calibration, FN571, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

041W490101	acetone (65.8)
041W490301	2-butanone (26.9)
041WW10101	2-hexanone (40.3)
041WW10201	

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, FN591, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

041WW10201DL	acetone (63.2)
041WW10301	2-butanone

The continuing calibration, FN610, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

041W480101 acetone (63.2)
2-butanone

Method Blanks

Associated blank	Compound	Conc.	Action Level
VBLKFQ	acetone	6	60
VBLKFU	acetone	6	6

Samples	Compound	Qualification
RABW000101	acetone	U
041W480101		

Trip Blanks

Associated blank	Compound	Conc.	Action Level
040TM03501	methylene chloride	3	30
	acetone	59	590

Samples	Compound	Qualification
RABW000101	methylene chloride	U
RABW000201		
RABW000301		

Trip Blanks

Associated blank	Compound	Conc.	Action Level
040TM03501	methylene chloride	3	30
	acetone	59	590
041TM01901	methylene chloride	1	10
	acetone	72	720

Samples	Compound	Qualification
041W480101	methylene chloride	U
041W490101		
041W490301		
041WW10101		
041WW10201		
041WW10201DL		
RABW000201	acetone	U
RABW000301		
041W490301		
041WW10201		
041WW10201DL		
041WW10301		

Compound Identification/Quantitation

Specific Finding:

For sample 041WW10201, reject the E-flagged results in favor of the results from the diluted samples 041WW10201DL.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
RABW000201 RABW000301	acetone 2-butanone 1,2-dibromo-3-chloropropane	+/-	J/R
RABW000101	acetone 2-butanone	+/-	J/R
041W490101 041W490301 041WW10101 041WW10201	chloromethane (63.9)	+/-	J/UJ
041W490101 041W490301 041WW10101 041WW10201	acetone (65.8) 2-butanone (26.9) 2-hexanone (40.3)	+/-	J/R
041WW10201DL 041WW10301	acetone (63.2) 2-butanone	+/-	J/R
041W480101	acetone (63.2) 2-butanone	+/-	J/R
RABW000101 041W480101	acetone	+	U
RABW000101 RABW000201 RABW000301	methylene chloride	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W480101	methylene chloride	+	U
041W490101			
041W490301			
041WW10101			
041WW10201			
041WW10201DL			
RABW000201	acetone	+	U
RABW000301			
041W490301			
041WW10201			
041WW10201DL			
041WW10301			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # M00901

A validation was performed on the Semivolatile Data from SDG M00901. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DJ674, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

RABM000101	2,4-dinitrophenol (74.6%)
041M480101	
041N480101	
RABM000201	

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
RABM000101 041M480101 041N480101 RABM000201	2,4-dinitrophenol	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, OLC01.0 10/92; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # M00901

A validation was performed on the Semivolatile Data from SDG M00901, the sample data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DJ602, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

041WW10101	hexachlorocyclopentadiene (54.5)
041W490101	

The continuing calibration, DJ715, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

RABW000201	hexachlorocyclopentadiene (60.8)
RABW000301	
041W480101	
RABW000101	
041WW10301	
041W490301	
041WW10201	

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041WW10101 041W490101	hexachlorocyclopentadiene (54.5)	+/-	J/UJ
RABW000201 RABW000301 041W480101 RABW000101 041WW10301 041W490301 041WW10201	hexachlorocyclopentadiene (60.8)	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # M00901

A validation was performed on the Pesticide/Aroclor Data from SDG M00901. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Surrogate Recoveries

One (1) sample exhibited a non-compliant DCB recovery.

Surrogate Recoveries, Continued

Specific Finding

The sample listed below exhibited a low DCB recovery. The positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

Sample ID	Surrogate	% Recovery
041WW10201	DCB-2	29%

Field Duplicates

The field duplicate pair of samples 41M480101 and 41N480101 exhibited positive results for several compounds. Three (3) compounds exhibited non-compliant RPDs.

Specific Findings

The field duplicate pair of samples 41M480101 and 41N480101 exhibited positive results and non-compliant RPDs for three (3) compounds. For the non-compliant compounds listed below, the positive results are qualified as estimated, J.

041M480101	4,4'-DDE (61%)
041N480101	4,4'-DDD (60%)
	4,4'-DDT (53%)

Analyte Identification/Quantitation

Four (4) samples required dilution to accurately quantitate target compounds. Several samples exhibited column quantitation %Ds greater than 25%.

Analyte Identification/Quantitation, Continued

Specific Findings

For the following samples and compounds, the results from the original analysis are replaced with the corresponding results from the dilution analysis. All other results from the dilution are rejected, UR, in favor of the results reported from the undiluted analysis.

RABM000101	4,4'-DDD
	4,4'-DDT
RABM000201	4,4'-DDE
041M480101	4,4'-DDD
041N480101	

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 20% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041WW10201	ALL	+/-	J/UJ
041M480101 041N480101	4,4'-DDE 4,4'-DDD 4,4'-DDT	+	J
RABM000101	4,4'-DDD 4,4'-DDT	+	D
RABM000201 041M480101 041N480101	4,4'-DDE 4,4'-DDD	+	D
RABM000101DL RABM000201DL 041M480101DL 041N480101DL	ALL OTHERS	+/-	UR
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # M00901

A validation was performed on the Metals Data from SDG M00901. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
*	•	Matrix Spike Recovery
	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	14.2 mg/kg	no impact
Calcium	3.01 mg/kg	no impact
Lead	0.28 mg/kg	all soil samples below 1.4 mg/kg
Sodium	71.4 mg/kg	all soil samples below 357 mg/kg
Zinc	0.95 mg/kg	all soil samples below 4.75 mg/kg

Aluminum	21.4 ug/l	no impact
Arsenic	3.28 ug/l	all water samples below 16.4 ug/l
Calcium	26.1 ug/l	no impact
Magnesium	22.7 ug/l	no impact
Sodium	889 ug/l	all water samples below 4445 ug/l

The field and equipment blank exhibited contamination for the following elements.

Aluminum	315 ug/l	all water samples below 1575 ug/l
Arsenic	3.9 ug/l	all water samples below 19.5 ug/l
Barium	5.1 ug/l	all water samples below 25.5 ug/l
Calcium	163 ug/l	no impact
Mercury	0.18 mg/kg	all water samples below 0.9 ug/l
Sodium	949 ug/l	all water samples below 4745 ug/l
Zinc	42.7 ug/l	all water samples below 214 ug/l

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Thallium	0.5 mg/kg	all soil samples below 5.0 mg/kg
Cobalt	-2.23 ug/l	all water samples below 23.3 ug/l

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Duplicate Analysis

Specific Finding

The Duplicate analysis for waters for Aluminum was outside the control limits (>20%). All positive results are qualified as estimated, "J".

Serial Dilution

Specific Finding

The Serial Dilution for waters for Calcium and Magnesium were outside the control limits (10%). All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	041WW10101	79
Antimony	041WW10301	69
Antimony	RABM000101	67
Antimony	RABM000301	77
Antimony	041M480101	68
Antimony	RABW000301	54
Antimony	041W480101	64

The post digestion spike recovery for GFAA was above the upper control limits. All positive results for the listed samples below are qualified as estimated, "J".

Element	Sample IDs	% recoveries
Antimony	041N480101	116

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 1.4 mg/kg	Pb.	+	U
all soil samples below 357 mg/kg	Na.		
all soil samples below 4.75 mg/kg	Zn.		
all water samples below 16.4 ug/l	As.		
all water samples below 4445 ug/l	Na.		
all water samples below 1575 ug/l	Al.		
all water samples below 19.5 ug/l	As.		
all water samples below 25.5 ug/l	Ba.		
all water samples below 0.9 ug/l	Hg.		
all water samples below 4745 ug/l	Na.		
all water samples below 214 ug/l	Zn.		
all water samples	Al.	+	J
all water samples	Ca and Mg.	+	J
041WW10101, WW10301, RABM000101, 301, 041M480101, RABW000301 AND 041W480101.	Sb.	+/U	J/UJ
041N480101.	Sb.	+	J
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	MZ1010
Date:	April 10, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	NAS Pensacola
Date Sampled:	February 5 - 8, 1996
Number of Samples:	5 Aqueous Sample(s) with 0 MS/MSD(s) 15 Non-aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively with Region IV Modifications
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Scarpa

Eugene M. Watson, Vice President

5-3-96

Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# MZ1010

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040EM01101	WATER	X		X		X		X	
040FM01101	WATER	X		X		X		X	
040TM04001	WATER	X							
040TM04101	WATER	X							
040TM04201	WATER	X							
040MZ21101	SOIL		X		X		X		X
040MZ22101	SOIL		X		X		X		X
040MZ22901	SOIL		X		X		X		X
040MZ23701	SOIL		X		X		X		X
040MZ24301	SOIL		X		X		X		X
040MZ25101	SOIL		X		X		X		X
040MZ30501	SOIL		X		X		X		X
040MZ50701	SOIL		X		X		X		X
040MZ51601	SOIL		X		X		X		X
040MZ52401	SOIL		X		X		X		X
040MZ54001	SOIL		X		X		X		X
040MZ71001	SOIL		X		X		X		X
040MZ72901	SOIL		X		X		X		X
040MZ73801	SOIL		X		X		X		X
040MZ81101	SOIL		X		X		X		X
Total Billable Samples (Water/Soil)		5	15	2	15	2	15	2	15

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG #MZ1010

A validation was performed on the Volatile Data from SDG MZ1010. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, GD599, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ22101	chloroethane (52.4%)
040MZ22901	
040MZ24301	
040MZ25101	

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria. Qualifications are required.

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated (UJ).

040MZ22101	chlorobenzene-d_5
040MZ22101RE	1,4-difluorobenzene chlorobenzene-d_5

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKGT	methylene chloride	2J	20
VBLKGX	acetone	3J	30

Samples	Compound	Qualification
040MZ22101 040MZ22901 040MZ24301 040MZ25101	methylene chloride	CRQL
040MZ23701 040MZ52401	acetone	CRQL
040MZ81101	acetone	U

Trip Blank

Associated blank	Compound	Concentration	Action Level
040TM04001	methylene chloride	3	30
	Acetone	21	210
040TM04101	methylene chloride	3	30
	Acetone	13	130

Samples	Compound	Qualification
040MZ21101 040MZ22101RE 040MZ23701 040MZ30501 040MZ54001	methylene chloride	CRQL

Trip Blank (continued)

Samples	Compound	Qualification
040MZ21101 040MZ22101 040MZ22101RE 040MZ300501	acetone	U
040MZ22901 040MZ54001	acetone	CRQL

Compound Identification /Quantitation

Reject sample 040MZ22101RE, in favor of the initial analysis, due to non compliant internal standard area recoveries.

System Performance and Overall Assessment

The overall system performance was fair. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ22101 040MZ22901 040MZ24301 040MZ25101	chloroethane	+/-	J/UJ
040MZ22101	All associated analytes chlorobenzene-d_5	+/-	J/UJ
040MZ22101RE	1,4-difluorobenzene chlorobenzene-d_5		
040MZ22101 040MZ22901 040MZ24301 040MZ25101	methylene chloride	+	CRQL
040MZ23701 040MZ52401	acetone	+	CRQL
040MZ81101 040MZ21101 040MZ22101 040MZ22101RE 040MZ300501	acetome	+	U
040MZ21101 040MZ22101RE 040MZ23701 040MZ30501 040MZ54001	methylene chloride	+	CRQL
040MZ22901 040MZ54001	acetone	+	CRQL
040MZ22101RE	all results	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # MZ1010

A validation was performed on the Semivolatile Data from SDG MZ1010. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DJ792, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040MZ51601	2,4-dinitrophenol (64.6)
040MZ21101	4-nitrophenol (59.3)
040MZ22101	4-nitroaniline (65.1)
	3,3'-dichlorobenzidine (65.6)

The continuing calibration, DJ830, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040MZ71001	3-nitroaniline (63.1)
	2,4-dinitrophenol (73.3)
	4-nitroaniline (65.1)
	carbazole (57.2)

Method Blanks

Associated blank	Compound	Conc.	Action Level
SBLKJU	bis(2-ethylhexyl) phthalate	93J	930
SBLKDS	bis(2-ethylhexyl) phthalate	71J	710
	di-n-butylphthalate	21J	210

Samples	Compound	Qualification
040MZ22901	bis(2-ethylhexyl) phthalate	CRQL
040MZ23701		
040MZ24301		
040MZ25101		
040MZ30501		

Method Blanks (continued)

Associated blank	Compound	Conc.	Action Level
SBLKJU	bis(2-ethylhexyl) phthalate	93J	930
SBLKDS	bis(2-ethylhexyl) phthalate	71J	710
	di-n-butylphthalate	21J	210

Samples	Compound	Qualification
040MZ50701 040MZ52401 040MZ54001 040MZ72901 040MZ73801 040MZ81101 040MZ21101 040MZ22101 040MZ51601 040MZ71001	bis(2-ethylhexyl) phthalate	CRQL
040MZ51601	di-n-butylphthalate	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ51601 040MZ21101 040MZ22101	2,4-dinitrophenol (64.6) 4-nitrophenol (59.3) 4-nitroaniline (65.1) 3,3'-dichlorobenzidine (65.6)	+/-	J/UJ
040MZ71001	3-nitroaniline (63.1) 2,4-dinitrophenol (73.3) 4-nitroaniline (65.1) carbazole (57.2)	+/-	J/UJ
040MZ22901 040MZ23701 040MZ24301 040MZ25101 040MZ30501 040MZ50701 040MZ52401 040MZ54001 040MZ72901 040MZ73801 040MZ81101 040MZ21101 040MZ22101 040MZ51601 040MZ71001	bis(2-ethylhexyl) phthalate	+	CRQL
040MZ51601	di-n-butylphthalate	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # MZ1010

A validation was performed on the Pesticide/Aroclor Data from SDG MZ1010. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Surrogate Recoveries

Several samples exhibited non-compliant TCX recoveries.

Surrogate Recoveries, Continued

Specific Finding

The samples listed below exhibited high TCX recoveries. The positive results are qualified as estimated, J.

Sample ID	Surrogate	% Recovery
040MZ21101	TCX-2	180%
040MZ22101	TCX-2	165%
040MZ22901	TCX-2	152%
040MZ23701	TCX-2	174%
040MZ50701	TCX-2	159%

Analyte Identification/Quantitation

One (1) sample required dilution to accurately quantitate target compounds. Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

For the following sample and compounds, the results from the original analysis are replaced with the corresponding results from the dilution analysis. All other results from the dilution are rejected, UR, in favor of the results reported from the undiluted analysis.

040MZ22101	4,4'-DDD
	4,4'-DDT
	Aroclor 1260

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 30% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ21101 040MZ22101 040MZ22901 040MZ23701 040MZ50701	ALL	+	J
040MZ22101	4,4'-DDD 4,4'-DDT Aroclor 1260	+	D
040MZ22101DL	ALL OTHERS	+/-	UR
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # MZ1010

A validation was performed on the Metals Data from SDG MZ1010. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	2.99 mg/kg	all soil samples below 15.0 mg/kg
Calcium	0.60 mg/kg	no impact

The Field blanks exhibited contamination for the following elements

Elements	Conc.	Samples affected
Zinc	8.0 ug/l	all soil samples below 4.0 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited more contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Antimony	-0.34 mg/kg	all soil samples below 3.4 mg/kg
Sodium	-3.34 mg/kg	no impact

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony (15%) was below 30%. All non-detect results are rejected and all positive results are qualfied as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits (<85% BUT >10%). All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ21101	40
Antimony	040MZ22101	61
Antimony	040MZ22901	46
Antimony	040MZ23701	51
Antimony	040MZ24301	61
Antimony	040MZ25101	69
Antimony	040MZ30501	61
Antimony	040MZ54001	67
Antimony	040MZ72901	82

The post digestion spike recovery for GFAA was above the upper control limits (>115%). All positive results for the listed samples below are qualified as estimated, "J".

Element	Sample IDs	% recoveries
Antimony	040MZ23701	121

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All soil samples below 15.0 mg/kg	Al.	+	U
All soil samples below 4.0 mg/kg	Zn.		
All soil samples below 3.4 mg/kg	Sb.	+/U	J/UJ
All soil samples	Sb.	+	J
		U	R
040MZ21101, 22101, 22901, 23701, 24301, 25101, 30501, 54001 and 72901.	Sb.	+/U	J/UJ
040MZ52401.	Sb.	+	J
All "B" results	all analytes	B	J

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RECEIVED
MAR 26 1996

Data Validation Report

SDG#:	MZ2340
Date:	March 22, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	January 2 - 3, 1996
Number of Samples:	2 Aqueous Sample(s) with 0 MS/MSD(s) 14 Non-aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig S. Swafford

Eugene M. Watson, Vice President

3-25-96
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# MZ2340

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040TM02701	WATER	X							
040TM02801	WATER	X							
040MZ22501	SOIL		X		X		X		X
040MZ22601	SOIL		X		X		X		X
040MZ22701	SOIL		X		X		X		X
040MZ22801	SOIL		X		X		X		X
040MZ23001	SOIL		X		X		X		X
040MZ23101	SOIL		X		X		X		X
040MZ23201	SOIL		X		X		X		X
040MZ23301	SOIL		X		X		X		X
040MZ23401	SOIL		X		X		X		X
040MZ23501	SOIL		X		X		X		X
040MZ23601	SOIL		X		X		X		X
040MZ23801	SOIL		X		X		X		X
040MZ23901	SOIL		X		X		X		X
040MZ24001	SOIL		X		X		X		X
Total Billable Samples	(Water/Soil)	2	14	0	14	0	14	0	14

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and are based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.8 Method; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # MZ2340

A validation was performed on the Volatile Data from SDG MZ2340. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Internal Standard Performance
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Continuing Calibrations

The continuing calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %Ds. The average RRF requirements were met for all continuing calibration standards.

Continuing Calibrations, continued
Specific Findings

The continuing calibration standard, CO832, contained compounds with %Ds greater than 25% but less than 50%. For the samples and noncompliant compounds listed below, the positive results are qualified as estimated, J.

040MZ23201 chloromethane (33.8%)

The continuing calibration standard, CO854, contained compounds with %Ds greater than 25% but less than 50%. For the samples and noncompliant compounds listed below, the positive results are qualified as estimated, J.

040MZ22801 methylene chloride (30.4%)

Method Blanks

Contamination for several target compounds was detected in the method blanks. All B flagged TICs are rejected.

	VBLKCP	VBLKFC	VBLKCS	VBLKCT
methylene chloride	3 μg/Kg	1μg/Kg	2 μg/Kg	2 μg/Kg
bromomethane	5 μg/Kg	--------	7 μg/Kg	6 μg/Kg
acetone	18 μg/Kg	--------	6 μg/Kg	--------
2-hexanone	--------	--------	--------	3 μg/Kg

Specific Finding

	Samples	Contaminant	Action Levels	Qualification
VBLKCP	040MZ23401	methylene chloride	30 μg/Kg	CRQL
	040MZ23901			
VBLKCS	040MZ22501		20 μg/Kg	
	040MZ22601			
	040MZ22701			
	040MZ23001			
	040MZ23101			
	040MZ23201			
	040MZ23301			

Method Blanks, continued
Specific Finding

	Samples	Contaminant	Action Levels	Qualification
VBLKCP	041MZ23501 041MZ23601 041MZ23801 041MZ24001	methylene chloride	30 µg/Kg	U
VBLKCP	040MZ23401 040MZ23501 040MZ23601 040MZ23801 040MZ23901 040MZ24001	acetone	180 µg/Kg	U
VBLKCP VBLKCS	040MZ23801 040MZ22501 040MZ22701 040MZ23101 040MZ23201	bromomethane	50 µg/Kg 70 µg/Kg	CRQL

The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria.

Field QC Blanks

Contamination for methylene chloride, acetone, and 2-butanone was detected in the field QC blanks. The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria.

	040TM02701	040TM02801	040EM00701	040FM00701
methylene chloride	3 µg/L	4 µg/L	9 µg/L	6 µg/L
acetone	13 µg/L	13 µg/L	--------	6 µg/L
chloromethane	1 µg/L	--------	--------	--------

Field QC Blanks, continued

Samples		Contaminant	Action Levels	Qualification
041TM02701	040MZ23201	methylene chloride	30 μg/Kg	CRQL
040EM00701	040MZ22801	methylene chloride	90 μg/Kg	CRQL

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 5% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ23201	chloromethane	+	J
040MZ22801	methylene chloride	+	J
040MZ23401 040MZ23901 040MZ22501 040MZ22601 040MZ22701 040MZ23001 040MZ23101 040MZ23201 040MZ23301	methylene chloride	+B	CRQL
041MZ23501 041MZ23601 041MZ23801 041MZ24001	methylene chloride	+B	U
040MZ23401 040MZ23501 040MZ23601 040MZ23801 040MZ23901 040MZ24001	acetone	+B	U
040MZ23801 040MZ22501 040MZ22701 040MZ23101 040MZ23201	bromomethane	+B	CRQL
040MZ23201 040MZ22801	methylene chloride	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # MZ2340

A validation was performed on the Semivolatile Data from SDG MZ2340. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DJ471, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ23401	2,2'-oxybis(1-chloropropane) (58.6%)
040MZ23501	2,4-dinitrophenol (51.2%)
040MZ23601	
040MZ23801	
040MZ23901	
040NZ24001	
040MZ22501	
040MZ22601	
040MZ22701	
040MZ22801	
040MZ23001	
040MZ23101	
040MZ23201	

The continuing calibration, DJ491, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ23301	3-nitroaniline (58.3%)
	2,4-dinitrophenol (59.7%)
	4,6-dinitro-2-methylphenol (70.0%)

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blanks

Associated blank	Compound	Concentration	Action Level
SBLKDL	bis(2ethylhexyl)phthalate	46J	460

Samples	Compound	Qualification
040MZ22501 040MZ22601 040MZ22701 040MZ22801 040MZ23001 040MZ23101 040MZ23201 040MZ23301 040MZ23401 040MZ23501 040MZ23801 040MZ23901	bis(2ethylhexyl)phthalate	CRQL
040MZ23601	bis(2ethylhexyl)phthalate	U

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ23401 040MZ23501 040MZ23601 040MZ23801 040MZ23901 040NZ24001 040MZ22501 040MZ22601 040MZ22701 040MZ22801 040MZ23001 040MZ23101 040MZ23201	2,2'-oxybis(1-chloropropane) 2,4-dinitrophenol	+/-	J/UJ
040MZ23301	3-nitroaniline 2,4-dinitrophenol 4,6-dinitro-2-methylphenol	+/-	J/UJ
040MZ22501 040MZ22601 040MZ22701 040MZ22801 040MZ23001 040MZ23101 040MZ23201 040MZ23301 040MZ23401 040MZ23501 040MZ23801 040MZ23901	bis(2ethylhexyl)phthalate	+	CRQL
040MZ23601	bis(2ethylhexyl)phthalate	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # MZ2340

A validation was performed on the Pesticide/Aroclor Data from SDG MZ2340. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Surrogate Recoveries

Eleven (11) samples exhibited a non-compliant TCX and/or DCB recoveries.

Surrogate Recoveries, Continued

Specific Finding

The samples listed below exhibited high TCX and/or DCB recoveries. The positive results are qualified as estimated, J.

Sample ID	Surrogate	% Recovery
040MZ22501	TCX-2	160%
040MZ22601	TCX-2/DCB-1	236%/204%
040MZ22801	TCX-2/DCB-1	310%/200%
040MZ23001	TCX-2	292%
040MZ23201	TCX-2	196%
040MZ23401	TCX-2	160%
040MZ23501	TCX-2	458%
040MZ23601	TCX-2	166%
040MZ23801	TCX-2	470%
040MZ23901	TCX-2	213%
040MZ24001	TCX-2	315%

Analyte Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 10% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ22501	ALL	+	J
040MZ22601			
040MZ22801			
040MZ23001			
040MZ23201			
040MZ23401			
040MZ23501			
040MZ23601			
040MZ23801			
040MZ23901			
040MZ24001			
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # MZ2340

A validation was performed on the Metals Data from SDG MZ2340. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	4.92 mg/kg	no impact
Calcium	2.13 mg/kg	no impact
Iron	1.61 mg/kg	no impact
Potassium	9.79 mg/kg	no impact
Sodium	6.68 mg/kg	no impact

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony (20%) was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ23401	58
Antimony	040MZ23501	60
Antimony	040MZ23601	59
Antimony	040MZ23801	81
Antimony	040MZ23901	64
Antimony	040MZ24001	46
Antimony	040MZ22501	77
Antimony	040MZ22701	71
Antimony	040MZ22801	67

The post digestion spike recovery for GFAA was above the upper control limits. All positive results for the listed samples below are qualified as estimated, "J".

Element	Sample IDs	% recoveries
Antimony	040MZ23301	120

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples	Sb.	+	J
		U	R
04MZ23401, 23501, 23601, 23801, 23901, 24001, 22501, 22701 and 22801.	Sb.	+/U	J/UJ
040MZ23301.	Sb.	+	J
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	MZ6020
Date:	April 10, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	NAS Pensacola
Date Sampled:	January 31 - February 5, 1996
Number of Samples:	2 Aqueous Sample(s) with 0 MS/MSD(s) 18 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively with Region IV Modifications
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig M. Seaton — 5-3-96

Eugene M. Watson, Vice President — Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# MZ6020

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040TM03801	WATER	X							
040TM03901	WATER	X							
040MZ10101	SOIL		X		X		X		X
040MZ10201	SOIL		X		X		X		X
040MZ10301	SOIL		X		X		X		X
040MZ10401	SOIL		X		X		X		X
040MZ10501	SOIL		X		X		X		X
040MZ10601	SOIL		X		X		X		X
040MZ10701	SOIL		X		X		X		X
040MZ10801	SOIL		X		X		X		X
040MZ10901	SOIL		X		X		X		X
040MZ11001	SOIL		X		X		X		X
040MZ11101	SOIL		X		X		X		X
040NZ11101	SOIL		X		X		X		X
040MZ11201	SOIL		X		X		X		X
040MZ11301	SOIL		X		X		X		X
040MZ13401	SOIL		X		X		X		X
040MZ20501	SOIL		X		X		X		X
040MZ60201	SOIL		X		X		X		X
040MZ61901	SOIL		X		X		X		X
Total Billable Samples	(Water/Soil)	2	18	0	18	0	18	0	18

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG #MZ6020

A validation was performed on the Volatile Data from SDG MZ6020. The data was evaluated based on the following parameters.

- * Data Completeness
- * Holding Times
- * GC/MS Tuning
- Calibrations
- Internal Standard Performance
- Blanks
- Surrogate Recoveries
- * Laboratory Control Samples
- * Field Duplicates
- Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, GD599, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ10101	chloroethane (52.4%)
040MZ10201	
040MZ13401	
040MZ20501	

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria. Qualifications are required.

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated (UJ).

040MZ10501	chlorobenzene-d_5
040MZ10601	
040MZ10901	
040MZ10501RE	
040MZ10601RE	
040MZ10701RE	
040MZ10901RE	
040MZ20501	
040MZ10701	1,4-difluorobenzene chlorobenzene-d_5
040MZ20501RE	bromochloromethane 1,4-difluorobenzene chlorobenzene-d_5

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKGS	acetone	4J	40
VBLKGT	methylene chloride	2J	20

Samples	Compound	Qualification
040MZ10501RE 040MZ11101 040MZ61901	acetone	CRQL
040MZ10601RE 040MZ10901RE 040MZ11201 040MZ60201	acetone	U
040MZ10101 040MZ10201 040MZ13401 040MZ20501	methylene chloride	CRQL

Trip Blank

Associated blank	Compound	Concentration	Action Level
040TM03701	methylene chloride	6	60
	Acetone	31	310

Trip Blank (continued)

Samples	Compound	Qualification
040MZ10101	acetone	U
040MZ10201		
040MZ10301		
040MZ10601		
040MZ13401		
040MZ20501		
040MZ20501RE		
040MZ10401	acetone	CRQL
040MZ10501		
040MZ10701		
040MZ10901		
040NZ11101		
040MZ10301	methylene chloride	CRQL
040MZ10401		
040MZ10501		
040MZ10501RE		
040MZ10601RE		
040MZ10701		
040MZ10701RE		
040MZ10801		
040MZ10901		
040MZ10901RE		
040MZ11001		
040MZ11101		
040MZ11201		
040MZ20501RE		
040MZ60201		
040MZ61901		

Surrogates

All of the surrogate recoveries for the and samples were not within QA/QC limits. Sample 040MZ20501RE exhibited high surrogates recoveries for 1,2-dichloroethane-d_4. Qualify all positive results as estimated (J).

Compound Identification /Quantitation

Reject samples 040MZ10501RE, 040MZ10601RE, and 040MZ10901RE, in favor of the initial analysis, due to non compliant internal standard area recoveries.

Reject sample 040MZ10701, in favor of the reanalysis, due to non compliant internal standard area recoveries.

Reject sample 040MZ20501RE, in favor of initial analysis, due to non compliant surrogate and internal standard area recoveries.

System Performance and Overall Assessment

The overall system performance was fair. The data reviewer estimates that less than 10% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ10101 040MZ10201 040MZ13401 040MZ20501	chloroethane	+/-	J/UJ
040MZ10501 040MZ10601 040MZ10901 040MZ10501RE 040MZ10601RE 040MZ10701RE 040MZ10901RE 040MZ20501	All associated analytes chlorobenzene-d_5	+/-	J/UJ
040MZ10701	1,4-difluorobenzene chlorobenzene-d_5		
040MZ20501RE	bromochloromethane 1,4-difluorobenzene chlorobenzene-d_5		
040MZ10501RE 040MZ11101 040MZ61901	acetone	+	CRQL
040MZ10601RE 040MZ10901RE 040MZ11201 040MZ60201	acetone	+	U
040MZ10101 040MZ10201 040MZ13401 040MZ20501	methylene chloride	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ10101	acetone	+	U
040MZ10201			
040MZ10301			
040MZ10601			
040MZ13401			
040MZ20501			
040MZ20501RE			
040MZ10401	acetone	+	CRQL
040MZ10501			
040MZ10701			
040MZ10901			
040NZ11101			
040MZ10301	methylene chloride	+	CRQL
040MZ10401			
040MZ10501			
040MZ10501RE			
040MZ10601RE			
040MZ10701			
040MZ10701RE			
040MZ10801			
040MZ10901			
040MZ10901RE			
040MZ11001			
040MZ11101			
040MZ11201			
040MZ20501RE			
040MZ60201			
040MZ61901			
040MZ20501RE	all anlaytes	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ10501RE	all results	+/-	R
040MZ10601RE			
040MZ10901RE			
040MZ10701			
040MZ20501RE			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # MZ6020

A validation was performed on the Semivolatile Data from SDG MZ6020. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, AJ610, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040MZ10701	di-n-butylphthalate (-29.4)

The continuing calibration, AJ610, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040MZ10701	2,2'-oxybis(1-chloropropane) (-51.8)

The continuing calibration, DJ792, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040NZ11101	2,4-dinitrophenol (64.6)
	4-nitrophenol (59.3)
	4-nitroaniline (65.1)
	3,3'-dichlorobenzidine (65.6)

The continuing calibration, IG255, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040MZ10201	3,3'-dichlorobenzidine (62.7)
040MZ10301	
040MZ13401	
040MZ10801	

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, IG255, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

040MZ10201	4-chloroaniline (-195.1)
040MZ10301	
040MZ13401	
040MZ10801	

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ10701	di-n-butylphthalate (-29.4)	+	J
040MZ10701	2,2'-oxybis- (1-chloropropane) (-51.8)	+/-	J/UJ
040NZ11101	2,4-dinitrophenol (64.6) 4-nitrophenol (59.3) 4-nitroaniline (65.1) 3,3'-dichlorobenzidine (65.6)	+/-	J/UJ
040MZ10201 040MZ10301 040MZ13401 040MZ10801	3,3'-dichlorobenzidine (62.7)	+/-	J/UJ
040MZ10201 040MZ10301 040MZ13401 040MZ10801	4-chloroaniline (-195.1)	+/-	J/~~R~~ UR

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # MZ6020

A validation was performed on the Pesticide/Aroclor Data from SDG MZ6020. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Analyte Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 10% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # MZ6020

A validation was performed on the Metals Data from SDG MZ6020. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	2.50 mg/kg	no impact
Calcium	11.5 mg/kg	no impact
Chromium	0.95 mg/kg	all soil samples below 4.75 mg/kg
Cobalt	0.24 mg/kg	all soil samples below 1.2 mg/kg
Iron	4.12 mg/kg	no impact

Magnesium	3.28 mg/kg	no impact
Sodium	25.6 mg/kg	no impact
Zinc	0.53 mg/kg	all soil samples below 2.65 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited more contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Arsenic	-0.32 mg/kg	all soil samples below 3.2 mg/kg
Thallium	-0.47 mg/kg	all soil samples below 4.7 mg/kg

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recoveries for Antimony (49%), Selenium (63%) and Silver (72%) were below the lower control limits (<85% but >10%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

Laboratory Duplicate

Specific Finding

The difference for Selenium was not greater than 2 times the CRDL and will not be qualified.

Field Duplicate

Specific Finding

The RPD for Calcium (127%) was greater than 35%. All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was above the upper control limits (>115%). All positive results for the listed samples below are qualified as estimated, "J".

Element	Sample IDs	% recoveries
Antimony	040MZ60201	116
Antimony	040MZ10501	126
Antimony	040MZ10801	150
Antimony	040MZ10901	135
Antimony	040MZ11001	152
Antimony	040MZ11201	126
Antimony	040MZ11101	157
Antimony	040MZ11301	118
Antimony	040NZ11101	149
Antimony	040MZ10101	155
Antimony	040MZ13401	131
Antimony	040MZ20501	128

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All soil samples below 4.75 mg/kg	Cr.	+	U
All soil samples below 2.65 mg/kg	Zn.		
All soil samples below 3.2 mg/kg	As.	+/U	J/UJ
All soil samples below 4.7 mg/kg	Tl.		
All soil samples	Sb, Se and Ag.	+/U	J/UJ
All soil samples	Ca.	+	J
040MZ60201, 10501, 10801, 10901, 11001, 11201, 11101, 11301, NZ11101, MZ10101, 10301, 13401 and 2050.	Sb.	+	J
All "B" results	all analytes	B	J

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890
(770) 923-8769 (Fax)

EnSafe/Allen & Hoshall
5720 Summer Trees Drive, Suite 8
Memphis, TN 38134
Attn: Drew Cowan

5/15/96

10 of 14

Dear Mr. Cowan:

Please find enclosed data validation narratives, flagged Form I's and qualified electronic data for SDGs Z13601 and Z30201.

We are pleased to be of service to EnSafe/Allen & Hoshall. Please call me at (770) 923-3890 if you have any questions.

Sincerely,

Kevin C. Harmon
Client Services Director

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890
(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY:	Ensafe/Allen & Hoshall
SITE NAME:	NAS Pensacola, Sites 40 and 41
PROJECT NUMBER:	8500.14
CONTRACTED LAB:	Ceimic Corporation
QA/QC LEVEL:	EPA Level IV
EPA METHOD:	SOW ILM03.0
VALIDATION GUIDELINES:	*USEPA CLP National Functional Guidelines for Inorganic Data Review,* 1994
SAMPLE MATRIX:	Sediment
TYPE OF ANALYSIS:	Total Metals
SDG NUMBER:	Z13601 (Level IV)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Total Metals
040MZ13001	960182-02	Sediment	X
040MZ13601	960182-01	Sediment	X
040MZ21501	960182-05	Sediment	X
040MZ21801	960182-14	Sediment	X
040MZ22001	960182-07	Sediment	X
040MZ22201	960182-06	Sediment	X
040MZ22501	960182-11	Sediment	X
040MZ22601	960182-09	Sediment	X
040MZ22801	960182-10	Sediment	X
040MZ23101	960182-13	Sediment	X
040MZ23601	960182-12	Sediment	X
040MZ24401	960182-15	Sediment	X
040MZ24701	960182-16	Sediment	X
040MZ40501	960182-03	Sediment	X
040MZ51301	960182-08	Sediment	X
041M030401	960182-19	Sediment	X
041M030501	960182-20	Sediment	X
041M04D201	960182-18	Sediment	X
041M160201	960182-17	Sediment	X
040M63A301	960182-04	Sediment	X

Data Qualifier Definitions

J	-	The association numerical value is an estimated quantity.
R	-	The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U	-	The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ	-	The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Client Sample #	Lab Sample #	Matrix	Total Metals
040MZ13001RE/D*	960182-02D	Sediment	+
040MZ13001S	960182-02S	Sediment	+

* = Reanalysis and Laboratory Duplicate samples are one and the same.
+ = Non-billable Quality Control Sample

RE/D* = MATRIX DUPLICATE, S = MATRIX SPIKE

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE: Keri C. Harmon

DATA QUALIFICATION SUMMARY

Ceimic Corporation - Z13601, Level IV CLP Inorganics

SAMPLES: 040MZ13001, 040MZ13601, 040MZ21501, 040MZ21801, 040MZ22001, 040MZ22201, 040MZ22501, 040MZ22601, 040MZ22801, 040MZ23101, 040MZ23601, 040MZ24401, 040MZ24701, 040MZ40501, 040MZ51301, 041M030401, 041M030501, 041M04D201, 041M160201, 041M63A301, 040MZ13001RE/D*, 040MZ13001S

TOTAL METALS

I.) Holding Times:

The holding times from sampling date to analysis date were 78 to 129 days for all samples in this SDG, which grossly exceeded the 28 day QC limit for mercury. All positive results for mercury were flagged as estimated (J) and all non-detect mercury results were rejected (R).

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration Verification (CCV):

All Continuing Calibration criteria were met, so no action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank Type/ID#	Analyte	Max Conc.	Action Level
PBS	aluminum	13.4 mg/kg	67.0 mg/kg
CCB11	barium	7.00 ug/L	7.00 mg/kg
CCB12	cadmium	2.70 ug/L	2.70 mg/kg
CCB6	calcium	97.6 ug/L	97.6 mg/kg
CCB11	cobalt	4.20 ug/L	4.20 mg/kg
PBS	iron	19.9 mg/kg	99.5 mg/kg
CCB6	lead	80.6 ug/L	80.6 mg/kg
PBS	magnesium	11.2 mg/kg	56.0 mg/kg
CCB11	manganese	4.10 ug/L	4.10 mg/kg

Blank Type/ID#	Analyte	Max Conc.	Action Level
PBS	mercury	0.06 mg/kg	0.30 mg/kg
PBS	selenium	0.27 mg/kg	1.35 mg/kg
CCB4	sodium	597 ug/L	2990 mg/kg
CCB11	silver	5.40 ug/L	5.40 mg/kg
PBS	zinc	0.28 mg/kg	1.40 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

After correction for percent solids, all results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for sediment samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB8	arsenic	-4.10 ug/L	4.10 mg/kg
CCB1	cadmium	-2.20 ug/L	2.20 mg/kg
CCB2	chromium	-5.40 ug/L	5.40 mg/kg
CCB4	manganese	-1.50 ug/L	1.50 mg/kg
CCB4	nickel	-12.4 ug/L	12.4 mg/kg
PBS	silver	-0.26 mg/kg	1.30 mg/kg
PBS	thallium	-0.59 mg/kg	2.95 mg/kg
ICB1	zinc	-8.10 ug/L	8.10 mg/kg

ICB = Initial Calibration Blank, PBS = Preparation Blank (Soil)

After correction for percent solids, all associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met, so no action was taken.

The following analytes were present in ICS Solution A at concentrations greater than the IDL:

antimony	50 ug/L
barium	3 ug/L
manganese	8 ug/L
silver	8 ug/L
sodium	350 ug/L
vanadium	10 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

arsenic	-4 ug/L
chromium	-10 ug/L
cobalt	-8 ug/L
silver	-6 ug/L
sodium	-79 ug/L
zinc	-6 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) of selenium (21%) and vanadium (11%) in sediment sample 040MZ13001L exceeded the 10% QC limit. Positive results for selenium and vanadium in all associated sediment samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The soil LCS Percent Recoveries (%R's) of cobalt (131%) and selenium (450%) exceeded the 80-120% QC limits. All positive results for these analytes in the associated sediment samples were flagged as estimated (J).

VII.) Duplicate Sample Analysis:

The Relative Percent Differences (RPD's) of lead (78%) and selenium (47%) in laboratory duplicate samples 040MZ13001 and 040MZ13001D exceeded the 35% QC limit for sediment samples. All positive and non-detect results for these analytes in the associated sediment samples were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike Recoveries:

The Percent Recoveries (%R's) of the following analytes in sediment spiked sample 040MZ30101S were outside the 75-125% QC limits:

antimony	-272%
arsenic	131%
copper	127%
lead	337%
silver	0%
thallium	0%

All positive results for arsenic, copper and lead in the associated samples were flagged as estimated (J). All associated positive sample results for antimony, silver and thallium were flagged as estimated (J) and all non-detects were rejected (R) since the recoveries for these analytes were below the 30% rejection limit.

The concentration of selenium in unspiked sample 040MZ13001 exceeded the concentration of the spike added by more than 4X. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

Laboratory Duplicate sample 041MZ13001D was identified on the spreadsheet as "041MZ13001RE." This sample was processed and routinely flagged by the laboratory. The laboratory flags were removed during validation. This sample was not validated as a routine sample, but rather was treated as a QC laboratory duplicate sample which did not require qualification. The validator changed the sample ID on the spreadsheet to "041MZ13001RE/D."

All non-detect mercury results were rejected because of excessive (greater than 2X QC limits) holding time exceedances. All non-detect results for antimony, silver and thallium were rejected because of very low (less than 30%) matrix spike recoveries. All other laboratory data were acceptable with qualifications.

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Data Validation Report

SDG#:	Z20601
Date:	March 29, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	January 12, 1996
Number of Samples:	1 Aqueous Sample(s) with 0 MS/MSD(s) 5 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig H. Hearfson
for Eugene M. Watson, Vice President

4-2-96
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# Z20601

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040TM03301	WATER	X							
040MZ20601	SOIL		X		X		X		X
040MZ20701	SOIL		X		X		X		X
040NZ20701	SOIL		X		X		X		X
040MZ51001	SOIL		X		X		X		X
040MZ51201	SOIL		X		X		X		X
Total Billable Samples	(Water/Soil)	1	5	0	5	0	5	0	5

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # Z20601

A validation was performed on the Volatile Data from SDG Z20601. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, CQ913, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040MZ20601 2-butanone (56.5%)

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Trip Blank

Associated blank	Compound	Concentration	Action Level
041TM03301	acetone	9J	90
	Methylene chloride	5J	50

Samples	Compound	Qualification
040MZ20601 040NZ20701	methylene chloride	CRQL
040MZ51201	acetone	U

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 10% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
	All associated analytes	+/-	J/UJ
040MZ20601	2-butanone		
040MZ20601 040NZ20701	methylene chloride	+	CRQL
040MZ51201	acetone	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z20601

A validation was performed on the Semivolatile Data from SDG Z20601. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DJ540, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ51201	4,6-dinitro-2-methylphenol (67.6%)
040MZ51001	
040MZ20701	

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blanks

Associated blank	Compound	Concentration	Action Level
SBLKDH	bis(2-ethylhexyl)phthalate	33J	330

Samples	Compound	Qualification
040MZ20601	bis(2-ethylhexyl)phthalate	CRQL
040MZ51001		
040MZ51201		

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ51201 040MZ51001 040MZ20701	4,6-dinitro-2-methylphenol	+/-	J/UJ
040MZ20601 040MZ51001 040MZ51201	bis(2-ethylhexyl)phthalate	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z20601

A validation was performed on the Pesticide/Aroclor Data from SDG Z20601. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptably linear for all compounds.

Initial Calibrations, Continued

Specific Findings

The initial calibration of 1/20/96 contained a compound with a %RSD greater than 20%. For the samples and the non-compliant compound listed below, all positive results are qualified as estimated, J, and all non-detect results are qualified as estimated, UJ.

All samples	Alpha-BHC (20.6%)

Analyte Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 20% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
All samples	Alpha-BHC	+/-	J/UJ
ALL	ALL P. >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z20601

A validation was performed on the Metals Data from SDG Z20601. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	8.67 mg/kg	no impact
Arsenic	0.34 mg/kg	all soil samples below 1.7 mg/kg
Calcium	4.59 mg/kg	no impact
Iron	2.20 mg/kg	no impact
Sodium	13.1 mg/kg	no impact

Thallium	0.39 mg/kg	all soil samples below 1.95 mg/kg
Zinc	0.59 mg/kg	all soil samples below 2.95 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony (39%) was below the lower control limits (<75% but >30%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

Laboratory Duplicate Analysis

Specific Finding

The Duplicate analysis for Aluminum (44%) was outside the control limits of 35%. All positive results are qualified as estimated, 'J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ20701	82
Antimony	040MZ51201	51
Antimony	040NZ20701	82
Antimony	040MZ20601	52
Antimony	040MZ51001	57

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 1.7 mg/kg	As.	+	U
all soil samples below 1.95 mg/kg	Tl.		
all soil samples below 2.95 mg/kg	Zn.		
all soil samples	Sb.	+/U	J/UJ
all soil samples	Al.	+	J
040MZ20701, 51201, NZ20701, MZ20601 and 51001.	Sb.	+/U	J/UJ
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	Z22401
Date:	March 22, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	January 4 - 5, 1996
Number of Samples:	4 Aqueous Sample(s) with 0 MS/MSD(s) 9 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Surfass — 3-25-96

Eugene M. Watson, Vice President — Date+

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SDG# Z22401

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040EM00701	WATER	X		X		X		X	
040FM00701	WATER	X		X		X		X	
040TM02901	WATER	X							
040TM03001	WATER	X							
040MZ20801	SOIL		X		X		X		X
040MZ20901	SOIL		X		X		X		X
040MZ21601	SOIL		X		X		X		X
040MZ21701	SOIL		X		X		X		X
040MZ21801	SOIL		X		X		X		X
040NZ21801	SOIL		X		X		X		X
040MZ21901	SOIL		X		X		X		X
040MZ22301	SOIL		X		X		X		X
040MZ22401	SOIL		X		X		X		X
Total Billable Samples (Water/Soil)		4	9	2	9	2	9	2	9

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and are based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.8 Method; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z22401

A validation was performed on the Volatile Data from SDG Z22401. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
	•	Field Duplicates
	•	Internal Standard Performance
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Continuing Calibrations

The continuing calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %Ds. The average RRF requirements were met for all continuing calibration standards.

Continuing Calibrations, continued

Specific Findings

The continuing calibration standard, CO870, contained compounds with %Ds greater than 25% but less than 50%. For the samples and noncompliant compounds listed below, the positive results are qualified as estimated, J.

040MZ21701 acetone (28.6%)

Method Blanks

Contamination for several target compounds was detected in the method blanks. All B flagged TICs are rejected.

	VBLKCS	VBLKCT	VBLKCU
methylene chloride	2 µg/Kg	2 µg/Kg	3 µg/Kg
bromomethane	7 µg/Kg	6 µg/Kg	2 µg/Kg
acetone	6 µg/Kg	--------	--------
4-methyl-2-pentanone	3 µg/Kg	--------	4 µg/Kg
2-hexanone	--------	3 µg/Kg	6 µg/Kg

Specific Finding

	Samples	Contaminant	Action Levels	Qualification
VBLKCS	041MZ22301	methylene chloride	20 µg/Kg	CRQL
	041MZ22401			
VBLKCT	040MZ21601			
	040MZ21801			
	040MZ21701			
VBLKCT	040MZ20801	methylene chloride	20 µg/Kg	U
	040MZ20901			

Method Blanks, continued

Specific Findings, continued

	Samples	Contaminant	Action Levels	Qualification
VBLKCS	040MZ22301	bromomethane	70 µg/Kg	CRQL
VBLKCT	040MZ20801		20 µg/Kg	
	040NZ21801			

Field QC Blanks

Contamination for methylene chloride, acetone, and 2-butanone was detected in the field QC blanks. The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moistures as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria.

	040TM02901	**040TM03001**	**040EM00701**	**040FM00701**
methylene chloride	6 µg/L	3 µg/L	9 µg/L	6 µg/L
acetone	--------	24 µg/L	--------	6 µg/L
2-butanone	--------	4 µg/L	--------	--------

Specific Finding

	Samples	Contaminant	Action Levels	Qualification
041TM02901	040NZ21801	methylene chloride	60 µg/Kg	U
	040MZ21901 040MZ21901RE 40MZ22401RE	methylene chloride	60 µg/Kg	CRQL
040TM03001	040MZ20801 040MZ20901	acetone	240 µg/Kg	U
040FM00701	040MZ21601	acetone	60 µg/Kg	U

Internal Standard Areas

Several samples exhibited noncompliant IS EICP area recoveries.

Specific Findings

The following samples exhibited noncompliant internal standard area recoveries. All associated positive and non-detect results are qualified as estimated, J/UJ.

041MZ22401	chlorobenzene-d_5
041MZ21901RE	
040MZ21901	1,4-difluorobenzene
040MZ22401RE	chlorobenzene-d_5

Field Duplicates

Specific Finding

The positive results reported for acetone in the following field duplicate pair exhibited poor field duplicate precision (76%RPD). The results are qualified as estimated, J.

040MZ21801
040NZ21801

Compound Quantitation

Specific Finding

The samples noted below are rejected, UR, in favor of the initial analysis of the sample. The samples exhibited similar internal standard results.

040MZ21901RE
040MZ22401RE

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 5% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ21701	acetone	+	J
041MZ22301 041MZ22401 040MZ21601 040MZ21801 040MZ21701	methylene chloride	+B	CRQL
040MZ20801 040MZ20901	methylene chloride	+B	U
040MZ22301 040MZ20801 040NZ21801	bromomethane	+B	CRQL
040NZ21801	methylene chloride	+	U
040MZ21901 040MZ21901RE 040MZ22401RE	methylene chloride	+	CRQL
040MZ20801 040MZ20901	acetone	+	U
040MZ21601	acetone	+	U
041MZ22401 041MZ21901RE	All Associated with chlorobenzene-d_5	+/-	J/UJ
040MZ21901 040MZ22401RE	All Associated with 1,4-difluorobenzene chlorobenzene-d_5	+/-	J/UJ

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ21801 040NZ21801	acetone	+	J
040MZ21901RE 040MZ22401RE	All compounds	+/-	UR

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z22401

A validation was performed on the Semivolatile Data from SDG Z22401. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, AJ253, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ22401	2,2'-oxybis(1-chloropropane) (60.8%)
040MZ22301	2,4-dinitrophenol (53.0%)
040MZ21901	
040MZ21701	
040MZ21601	
040NZ21801	
040MZ20901	
040MZ20801	

The continuing calibration, AJ270, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ21801	2,2'-oxybis(1-chloropropane) (57.1%)

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blanks

Associated blank	Compound	Concentration	Action Level
SBLKAG	di-n-butylphthalate	23J	230

Method Blanks (continued)

Samples	Compound	Qualification
040MZ21701 040MZ21901	di-n-butylphthalate	CRQL

Rinseate Blanks

Associated blank	Compound	Concentration	Action Level
040EM00701	bis(2-ethylhexyl)phthalate	3J	30

Samples	Compound	Qualification
040MZ20801 040MZ21601 040MZ21701 040MZ21801 040MZ22301 040MZ22401	bis(2-ethylhexyl)phthalate	CRQL
040NZ21801 040MZ21901	bis(2-ethylhexyl)phthalate	U

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ22401 040MZ22301 040MZ21901 040MZ21701 040MZ21601 040NZ21801 040MZ20901 040MZ20801	2,2'-oxybis(1-chloropropane) 2,4-dinitrophenol	+/-	J/UJ
040MZ21801	2,2'-oxybis(1-chloropropane)	+/-	J/UJ
040MZ21701 040MZ21901	di-n-butylphthalate	+	CRQL
040MZ20801 040MZ21601 040MZ21701 040MZ21801 040MZ22301 040MZ22401	bis(2-ethylhexyl)phthalate	+	CRQL
040NZ21801 040MZ21901	bis(2-ethylhexyl)phthalate	+	U

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QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z22401

A validation was performed on the Pesticide/Aroclor Data from SDG Z22401. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptably linear for all compounds.

Initial Calibrations, Continued

Specific Findings

The initial calibration of 1/20/96 contained compounds with %RSDs greater than 20%. For the samples and the non-compliant compound listed below, all positive results are qualified as estimated, J, and all non-detect results are qualified as estimated, UJ.

All samples	Alpha-BHC (20.6%)

Surrogate Recoveries

Four (4) samples exhibited a non-compliant TCX recovery.

Specific Finding

The samples listed below exhibited high TCX recoveries. The positive results are qualified as estimated, J.

Sample ID	Surrogate	% Recovery
040MZ20801	TCX-2	166%
040MZ21601	TCX-2	350%
040MZ21901	TCX-2	246%
040MZ21801	TCX-2	223%

Field Duplicates

The field duplicate pair of samples 040MZ21801 and 040NZ21801 exhibited positive results for several compounds. Three (3) compounds exhibited non-compliant RPDs.

Specific Findings

The field duplicate pair of samples 040MZ21801 and 040NZ21801 exhibited positive results and non-compliant RPDs for three (3) compounds. For the non-compliant compounds listed below, the positive results are qualified as estimated, J.

040MZ21801	Alpha-BHC (62%)
040NZ21801	Dieldrin (75%)
	Aroclor 1260 (131%)

Analyte Identification/Quantitation

One (1) sample required dilution to accurately quantitate target compounds. Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

For the following sample and compounds, the results from the original analysis are replaced with the corresponding results from the dilution analysis. All other results from the dilution are rejected, UR, in favor of the results reported from the undiluted analysis.

040NZ21801	4,4'-DDD
	Aroclor 1260

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 30% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
All samples	Alpha-BHC	+/-	J/UJ
040MZ20801 040MZ21601 040MZ21901 040MZ21801	ALL	+	J
040MZ21801 040NZ21801	Alpha-BHC Dieldrin Aroclor 1260	+	J
040NZ21801	4,4'-DDD Aroclor 1260	+	D
040NZ21801DL	ALL OTHERS	+/-	UR
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z22401

A validation was performed on the Metals Data from SDG Z22401. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
	•	Field Duplicates
*	•	Laboratory Control Samples
	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	8.67 mg/kg	no impact
Calcium	4.59 mg/kg	no impact
Iron	2.20 mg/kg	no impact
Lead	0.13 mg/kg	no impact
Sodium	13.1 mg/kg	no impact

Zinc	0.59 mg/kg	all soil samples below 2.95 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for Antimony (25%) was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

The Matrix Spike recoveries for soils for Arsenic (73%), Selenium (68%) and Silver (68%) were below the lower control limits (<75% but .30%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

Field Duplicate Analysis

Specific Finding

The field duplicate analysis for soils for Calcium (152%) was above 50%. All positive results are qualified as estimated, "J". The laboratory duplicate for Calcium was less than 2 times the CRDL and will not be qualified.

Serial Dilution

Specific Finding

The Serial Dilution for soils for Zinc (15%) was outside the control limits. All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ22401	61
Antimony	040MZ22301	43
Antimony	040MZ21901	78
Antimony	040MZ21701	66

Antimony	040MZ21601	41
Antimony	040MZ21801	68

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	Q
all soil samples below 2.95 mg/kg	Zn.	+	U
all soil samples	Sb.	+	J
		U	R
all soil samples	As, Se and Ag.	+/U	J/UJ
All soil samples	Ca.	+	J
all soil samples	Zn.	+	J
040MZ22401, 040MZ22301, 040MZ21901, 040MZ21701, 040MZ21601 AND 040MZ21801.	Sb.	+/U	J/UJ
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	Z25001
Date:	March 29, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	January 17 - 24, 1996
Number of Samples:	1 Aqueous Sample(s) with 25 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Swyson
Eugene M. Watson, Vice President

4-2-96
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# Z25001

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040TM03401	WATER	X							
040MZ25001	SOIL		X						
040MZ25201	SOIL		X						
040MZ25301	SOIL		X						
040MZ25401	SOIL		X						
040MZ25501	SOIL		X						
040MZ25601	SOIL		X						
040MZ25701	SOIL		X						
040MZ13001	SOIL				X		X		X
040MZ13101	SOIL				X		X		X
040MZ13201	SOIL				X		X		X
040MZ13301	SOIL				X		X		X
040MZ13501	SOIL				X		X		X
040MZ13601	SOIL				X		X		X
040MZ13701	SOIL				X		X		X
040MZ13801	SOIL				X		X		X
040MZ25001	SOIL				X		X		X
040MZ25201	SOIL				X		X		X
040MZ25301	SOIL				X		X		X
040MZ25401	SOIL				X		X		X
040MZ25501	SOIL				X		X		X
040MZ25601	SOIL				X		X		X
040MZ25701	SOIL				X		X		X
040MZ31601	SOIL				X		X		X
040MZ40501	SOIL				X		X		X
040MZ41501	SOIL				X		X		X
Total Billable Samples (Water/Soil)		1	7	0	18	0	18	0	18

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # Z25001

A validation was performed on the Volatile Data from SDG Z25001. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, BU497, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040MZ25601	acetone (61.9%)
040MZ25701	

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKBZ	methylene chloride	3J	30
VBLKBA	methylene chloride	1J	10

Samples	Compound	Qualification
040MZ25201	methylene chloride	CRQL
040MZ25301		
040MZ25401		
040MZ25501		
040MZ25001		

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ25601 040MZ25701	acetone	+/-	J/UJ
040MZ25201 040MZ25301 040MZ25401 040MZ25501 040MZ25001	methylene chloride	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z25001

A validation was performed on the Semivolatile Data from SDG Z25001. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DJ698, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ13301	2,4-dinitrophenol (61.5%)
040MZ13501	4-nitroaniline (55.0%)

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ13301	2,4-dinitrophenol	+/-	J/UJ
040MZ13501	4-nitroaniline		

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QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z25001

A validation was performed on the Pesticide/Aroclor Data from SDG Z25001. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptably linear for all compounds.

Initial Calibrations, Continued

Specific Findings

The initial calibration of 2/09/96 contained compounds with %RSDs greater than 20%. For the samples and the non-compliant compound listed below, all positive results are qualified as estimated, J, and all non-detect results are qualified as estimated, UJ.

All samples	Delta-BHC (20.8%)

Continuing Calibrations

One (1) continuing calibration standard exhibited %Ds above the QC limits.

Specific Finding

The continuing calibration of 02/21/96 08:18 exhibited %Ds greater than 25%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

040MZ40501	4,4'-DDT (-32.0%)

Analyte Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 20% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
All samples	Delta-BHC	+/-	J/UJ
040MZ40501	4,4'-DDT	+/-	J/UJ
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z25001

A validation was performed on the Metals Data from SDG Z25001. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	19.3 mg/kg	no impact
Barium	0.27 mg/kg	all soil samples below 1.35 mg/kg
Calcium	5.60 mg/kg	no impact
Lead	0.26 mg/kg	all soil samples below 1.3 mg/kg
Magnesium	3.42 mg/kg	no impact

Potassium	21.9 mg/kg	all soil samples below 110 mg/kg
Sodium	87.5 mg/kg	no impact
Zinc	0.67 mg/kg	all soil samples below 3.35 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Antimony	-0.25 mg/kg	all soil samples below 2.5 mg/kg
Arsenic	-0.23 mg/kg	all soil samples below 2.3 mg/kg

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony (44%) was below the lower control limits (<75% but >30%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate Analysis

Specific Finding

The Duplicate analysis for Calcium (137%) was outside the control limits (>35%). All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ25001	65
Antimony	040MZ25201	77
Antimony	040MZ25601	58
Antimony	040MZ25701	70

Antimony	040MZ40501	51
Antimony	040MZ13001	46
Antimony	040MZ13301	62
Antimony	040MZ13601	75
Antimony	040MZ13701	43

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 1.35 mg/kg	Ba.	+	U
all soil samples below 1.3 mg/kg	Pb.		
all soil samples below 110 mg/kg	K.		
all soil samples below 3.35 mg/kg	Zn.		
all soil samples below 2.5 mg/kg	Sb.	+/U	J/UJ
all soil samples below 2.3 mg/kg	As.		
all soil samples	Sb.	+/U	J/UJ
all soil samples	Ca.	+	J
040MZ25001, 25201, 25601, 25701, 31601, 40501, 13001, 13301, 13601 and 13701.	Sb.	+/U	J/UJ
All "B" results	all analytes	B	J

VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890
(770) 923-8769 (Fax)

DATA VALIDATION SUMMARY REPORT

COMPANY:	Ensafe/Allen & Hoshall
SITE NAME:	NAS Pensacola, Sites 40 and 41
PROJECT NUMBER:	8500.14
CONTRACTED LAB:	Ceimic Corporation
QA/QC LEVEL:	EPA Level IV
EPA METHOD:	SOW ILM03.0
VALIDATION GUIDELINES:	*USEPA CLP National Functional Guidelines for Inorganic Data Review,* 1994
SAMPLE MATRIX:	Sediment
TYPE OF ANALYSIS:	Total Metals
SDG NUMBER:	Z30201 (Level IV)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Total Metals
040MZ30101	960183-02	Sediment	X
040MZ30201	960183-01	Sediment	X
040MZ40801	960183-11	Sediment	X
040MZ42401	960183-05	Sediment	X
040MZ53701	960183-03	Sediment	X
040MZ54101	960183-20	Sediment	X
040MZ61301	960183-12	Sediment	X
040MZ61801	960183-13	Sediment	X
040MZ62001	960183-14	Sediment	X
040MZ71401	960183-15	Sediment	X
040MZ73501	960183-17	Sediment	X
040MZ80701	960183-16	Sediment	X
040MZ81201	960183-19	Sediment	X
040MZ82101	960183-18	Sediment	X
040MZ90601	960183-10	Sediment	X
041M10A101	960183-04	Sediment	X
041M320301	960183-08	Sediment	X
041M330201	960183-09	Sediment	X
041M641401	960183-06	Sediment	X
040M641501	960183-07	Sediment	X

Client Sample #	Lab Sample #	Matrix	Total Metals
040MZ30101RE/D*	960183-02D	Sediment	+
040MZ30101S	960183-02S	Sediment	+

* = Reanalysis and Laboratory Duplicate samples are one and the same.
+ = Non-billable Quality Control Sample

RE/D* = MATRIX DUPLICATE, S = MATRIX SPIKE

D = MATRIX DUPLICATE, RE = REANALYSIS, S = MATRIX SPIKE

DATA REVIEWER(S): Marvin L. Smith, Jean M. Delashmit

RELEASE SIGNATURE:

Data Qualifier Definitions

J	-	The association numerical value is an estimated quantity.
R	-	The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U	-	The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ	-	The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Ceimic Corporation - Z30201, Level IV CLP Inorganics

SAMPLES: 040MZ30101, 040MZ30201, 040MZ40801, 040MZ42401, 040MZ53701, 040MZ54101, 040MZ61301, 040MZ61801, 040MZ62001, 040MZ71401, 040MZ73501, 040MZ80701, 040MZ81201, 040MZ82101, 040MZ90601, 041M10A101, 041M320301, 041M330201, 041M641401, 041M641501, 040MZ30101RE/D*, 040MZ30101S

TOTAL METALS

I.) Holding Times:

The holding times from sampling to analysis were 134 to 170 days for all samples in this SDG, which grossly exceeded the 28 day QC limit for mercury. All positive results for mercury were flagged as estimated (J) and all non-detect mercury results were rejected (R).

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met, so no action was necessary.

Continuing Calibration Verification (CCV):

All Continuing Calibration criteria were met, so no action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used for data qualification:

Blank Type/ID#	Analyte	Max Conc.	Action Level
PBS	aluminum	18.3 mg/kg	91.5 mg/kg
CCB9	antimony	46.8 ug/L	46.8 mg/kg
PBS	arsenic	4.83 mg/kg	24.2 mg/kg
CCB7	barium	7.1 ug/L	7.1 mg/kg
PBS	calcium	19.9 mg/kg	99.5 mg/kg
PBS	chromium	1.94 mg/kg	9.70 mg/kg
CCB9	cobalt	2.5 ug/L	2.5 mg/kg
PBS	copper	0.29 mg/kg	1.45 mg/kg
PBS	iron	25.1 mg/kg	126 mg/kg

Blank Type/ID#	Analyte	Max Conc.	Action Level
PBS	magnesium	10.9 mg/kg	54.5 mg/kg
CCB7	potassium	121 ug/L	121 mg/kg
PBS	selenium	0.80 mg/kg	4.0 mg/kg
CCB9	sodium	211 ug/L	211 mg/kg
PBS	zinc	0.38 mg/kg	1.9 mg/kg

CCB = Continuing Calibration Blank, PBS = Preparation Blank (Soil)

After correction for percent solids, all results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for sediment samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
ICB2	calcium	-6.40 ug/L	6.40 mg/kg
ICB2	iron	-17.2 ug/L	17.2 mg/kg
ICB2	manganese	-1.90 ug/L	1.90 mg/kg
PBS	sodium	-6.16 mg/kg	30.8 mg/kg
PBS	thallium	-0.84 mg/kg	4.20 mg/kg

ICB = Initial Calibration Blank, PBS = Preparation Blank (Soil)

After correction for percent solids, all associated positive sample results less than 5X the absolute value of the negative blank results and all associated non-detects were flagged as estimated (J) and (UJ).

IV.) ICP Interference Check Sample Results:

All Percent Recovery criteria were met.

The following analytes were present in ICS Solution A at concentrations greater than the IDL:

antimony	56 ug/L
manganese	2 ug/L
potassium	157 ug/L
silver	9 ug/L
sodium	48 ug/L
vanadium	10 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

Negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

chromium	-6 ug/L
cobalt	-5 ug/L
copper	-5 ug/L
nickel	-10 ug/L
sodium	-102 ug/L
zinc	-7 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) of iron (43%) and lead (12%) in sediment sample 040MZ30101L exceeded the 10% QC limit. Positive results for these analytes in all associated sediment samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

The soil LCS Percent Recoveries (%R's) of aluminum (76%), magnesium (61%) and sodium (76%) were below the 80-120% QC limits. All positive and non-detect results for these analytes in the associated sediment samples were flagged as estimated (J) and (UJ).

The soil LCS Percent Recoveries (%R's) of cobalt (137%) and potassium (131%) exceeded the 80-120% QC limits. All positive results for these analytes in the associated sediment samples were flagged as estimated (J).

VII.) Duplicate Sample Analysis:

The Relative Percent Differences (RPD's) of iron (56%), manganese (177%) and selenium (46%) in laboratory duplicate samples 040MZ30101 and 040MZ30101D exceeded the 35% QC limit for sediment samples. All positive and non-detect results for these analytes in the associated sediment samples were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike Recoveries:

The Percent Recoveries (%R's) of the following analytes in sediment spiked sample 040MZ30101S were below the 75-125% QC limits:

arsenic	38%
beryllium	62%
cadmium	30%
cobalt	71%
manganese	-248%
nickel	27%
silver	0%
thallium	0%
zinc	56%

All positive and non-detect results for arsenic, beryllium, cadmium, cobalt and zinc in all associated samples were flagged as estimated (J) and (UJ). All positive results for manganese, nickel, silver and thallium were flagged as estimated (J) and the non-detects were rejected (R) since the recoveries for these analytes were less than the 30% rejection limit.

The concentrations of antimony, chromium, lead and selenium in unspiked sample 040MZ30101 exceeded the concentration of the spike added to spiked sample 040MZ30101S by more than 4X. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met, so no action was necessary.

XII.) Quarterly Verification of Instrumental Parameters:

All criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

Laboratory Duplicate sample 041MZ30101D was identified on the spreadsheets as "041MZ30101RE." This sample was processed and routinely flagged by the laboratory. The laboratory flags were removed during validation. This sample was not validated as a routine sample, but rather was treated as a QC laboratory duplicate sample which would not require qualification. The validator changed the sample ID on the spreadsheet to "041MZ301D1RE/D."

All non-detect mercury results were rejected because of excessive (greater than 2X QC limits) holding time exceedances. All non-detect results for manganese, nickel, silver and thallium were rejected because of very low (less than 30%) matrix spike recoveries. All other laboratory data were acceptable with qualifications.

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

RECEIVED
MAR 26 1996

Data Validation Report

SDG#:	Z30301
Date:	March 22, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	November 29, 1995
Number of Samples:	4 Aqueous Sample(s) with 0 MS/MSD(s) 11 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Low Concentration Volatiles, Semivolatiles, Low Concentration Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig H. Serfass
Eugene M. Watson, Vice President

3-25-96
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# Z30301

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		LVOA		SV		LSV		P/P		TAL/CN	
040MZ30101	SOIL		X				X				X		X
040MZ30201	SOIL		X				X				X		X
040MZ30301	SOIL		X				X				X		X
040MZ30701	SOIL		X				X				X		X
040MZ30901	SOIL		X				X				X		X
040MZ31101	SOIL		X				X				X		X
040MZ40901	SOIL		X				X				X		X
041M120201	SOIL		X				X				X		X
041M570101	SOIL		X				X				X		X
041M720101	SOIL		X				X				X		X
041MZ20201	SOIL		X				X				X		X
040TM01801	WATER			X									
041W570101	WATER			X				X		X		X	
041W720101	WATER			X				X		X		X	
041TM00601	WATER			X									
Total Billable Samples	(Water/Soil)	0	11	4	0	0	11	2	0	2	11	2	11

VOA = CLP Volatiles
LVOA = CLP Low Concentrtion Volatiles
SV = CLP Semivolatiles
LSV = CLP Low Concentration Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and are based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.8 Method; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z30301

A validation was performed on the Volatile Data from SDG Z30301. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
	•	Internal Standard Performance
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Continuing Calibrations

The continuing calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %Ds. The average RRF requirements were met for all continuing calibration standards.

Continuing Calibrations, continued

Specific Findings

The continuing calibration standard, HB326, contained compounds with %Ds greater than 50% but less than 90%. For the samples and noncompliant compounds listed below, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

041M120201 acetone (68.2%)
041M720101

Method Blanks

Contamination for several target compounds was detected in the method blanks. All B flagged TICs are rejected.

	VBLKGL	VBLKCZ	VBLKCA
methylene chloride	10 µg/Kg	2 µg/Kg	2 µg/Kg
bromomethane	--------	3 µg/Kg	--------

Specific Finding

	Samples	Contaminant	Action Levels	Qualification
VBLKGL	040MZ30301 041MZ20201 040MZ30901 040MZ31101	methylene chloride	100 µg/Kg	CRQL
VBLKCZ	040MZ30201 040MZ30701RE 040MZ40901		20 µg/Kg	CRQL
VBLKCA	041M570101		20 µg/Kg	CRQL
VBLKGL	040MZ30701 040MZ30101	methylene chloride	100 µg/Kg	U

Method Blanks, continued

The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria.

Internal Standard Areas

One sample and its RE exhibited noncompliant IS EICP area recoveries.

Specific Findings

The following samples exhibited noncompliant internal standard area recoveries. All associated positive and non-detect results are qualified as estimated, J/UJ.

040MZ30701	1,4-difluorobenzene chlorobenzene-d_5
040MZ30701RE	All internal standards

Surrogate Recoveries

Specific Finding

The following sample exhibited a surrogate recovery above the QC limits. All reported positive results in the sample are qualified as estimated, J.

Samples	Surrogate	%Recovery
040MZ30701	1,2-dichloroethane-d4	125%

Compound Quantitation

Specific Finding

The samples noted below are rejected, UR, in favor of the initial analysis of the sample. The samples exhibited similar internal standard results.

040MZ30701RE

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 5% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041M120201 041M720101	acetone	+/-	J/UJ
040MZ30301 041MZ20201 040MZ30901 040MZ31101 040MZ30201 040MZ30701RE 040MZ40901 041M570101	methylene chloride	+B	CRQL
040MZ30701 040MZ30101	methylene chloride	+B	U
040MZ30701	All associated with 1,4-difluorobenzene chlorobenzene-d_5	+/-	J/UJ
040MZ30701RE	All associated with All internal standards	+/-	J/UJ
040MZ30701	1,2-dichloroethane-d4	+	J
040MZ30701RE	All compounds	+/-	UR

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # Z30301

A validation was performed on the Volatile Data from SDG Z30301. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs. The average RRFs for all of the compounds met the initial calibration criteria.

Initial Calibrations (continued)

Specific Finding:

The initial calibration analyzed on, 12/04/95, contained compounds with %RSD greater than 30% and RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detect (R).

041W720101	acetone (43.2)
	2-butanone

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Specific Finding:

The continuing calibration, FM602, contained compounds with RRFs less than 0.05. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

041W570101	acetone
	2-butanone
	2-hexanone (25.9)

Method Blanks

Associated blank	Compound	Conc.	Action Level
VBLKFW	acetone	11	110

Samples	Compound	Qualification
041W570101	acetone	U

Trip Blanks

Associated blank	Compound	Conc.	Action Level
041TM00601	methylene chloride	4	40

Samples	Compound	Qualification
041W720101	methylene chloride	CRQL

Compound Identification/Quantitation

Specific Finding:

For sample 041W570101, reject all E-flagged results in favor of the D-flagged results in the diluted sample. For the diluted sample 041W570101DL, reject all results (R) except for the D-flagged results with corresponding E-flagged results.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W720101	acetone (43.2) 2-butanone	+/-	J/R
041W570101	acetone 2-butanone 2-hexanone (25.9)	+/-	J/R
041W570101	acetone	+	U
041W720101	methylene chloride	+	CRQL
041W570101	All E-flagged results	+	R
041W570101DL	All results (R) except	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z30301

A validation was performed on the Semivolatile Data from SDG Z30301. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Specific Finding:

The continuing calibration, IF723, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

041M570101 4-chloroaniline (230.1%)

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, IF780, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

041M120201 hexachlorocyclopentadiene (68.4%)

The continuing calibration, IF780, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

041M120201 4-chloroaniline (190.9%)

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blanks

Associated blank	Compound	Concentration	Action Level
SBLKIK	bis(2ethylhexyl)phthalate	150J	1500
	Di-n-butylbenzylphthalte	21J	210
SBLKAI	bis(2ethylhexyl)phthalate	150J	1500
SBLKDF	bis(2ethylhexyl)phthalate	150J	1500

Method Blanks (continued)

Samples	Compound	Qualification
041M570101 040MZ30101 040MZ30701 040MZ31101 040MZ30201 041M720101	bis(2ethylhexyl)phthalate	CRQL
041MZ20201	bis(2ethylhexyl)phthalate	U
041M570101	Di-n-butylbenzylphthalte	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041M120201	hexachlorocyclopentadiene	+/-	J/UJ
041M120201	4-chloroaniline	+/-	J/R
041M570101 040MZ30101 040MZ30701 040MZ31101 040MZ30201 041M720101	bis(2ethylhexyl)phthalate	+	CRQL
041MZ20201	bis(2ethylhexyl)phthalate	+	U
041M570101	Di-n-butylbenzylphthalte	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, OLC01.0 10/92; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z30301

A validation was performed on the Semivolatile Data from SDG Z30301. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DJ154, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

041W570101	4-chloroaniline (59.4) 3,3'-dichlorobenzidine (60.2) 3-nitroaniline (64.1)

Field Blanks

Associated blank	Compound	Conc.	Action Level
041FM00401	bis(2-ethylhexyl) phthalate	9J	90

Samples	Compound	Qualification
041W720101	bis(2-ethylhexyl) phthalate	U

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W570101	4-chloroaniline (59.4) 3,3'-dichlorobenzidine (60.2) 3-nitroaniline (64.1)	+/-	J/UJ
041W720101	bis(2-ethylhexyl) phthalate	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z30301

A validation was performed on the Pesticide/Aroclor Data from SDG Z30301. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
	•	GC Performance
*	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

GC Performance

PEM0D and PEM1D (1/5/96 17:38) exhibited high %Ds for two (2) compounds.

GC Performance, Continued

Specific Finding

PEM0D and PEM1D (1/5/96 17:38) exhibited high %Ds for 4,4'-DDT and Methoxychlor. For the following samples and non-compliant compounds the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

041W720101	4,4'-DDT (-49.0%/-45.0%)
041MZ20201	Methoxychlor (-46.8%/-38.4%)
040MZ40901	
040MZ31101	
041M570101	
040MZ30301	
040MZ30901	
040MZ30701	
041W570101	
040MZ30101	
040MZ30201	
041M120201	
041M720101	

Surrogate Recoveries

One (1) sample exhibited a non-compliant TCX recovery.

Specific Finding

The sample listed below exhibited a low TCX recovery. The positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

Sample ID	Surrogate	% Recovery
040MZ30901	TCX-2	25%

Analyte Identification/Quantitation

One (1) sample required dilution to accurately quantitate target compounds. Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

For the following sample and compounds, the results from the original analysis are replaced with the corresponding results from the dilution analysis. All other results from the dilution are rejected, UR, in favor of the results reported from the undiluted analysis.

040MZ40101	Gamma-BHC Endrin

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 10% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W720101 041MZ20201 040MZ40901 040MZ31101 041M570101 040MZ30301 040MZ30901 040MZ30701 041W570101 040MZ30101 040MZ30201 041M120201 041M720101	4,4'-DDT Methoxychlor	+/-	J/UJ
040MZ30901	ALL	+/-	J/UJ
040MZ40101	Gamma-BHC Endrin	+	D
040MZ40101DL	ALL OTHERS	+/-	UR
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z30301

A validation was performed on the Metals Data from SDG Z30301. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Sodium	-7.14 mg/kg	all soil samples below 71.4 mg/kg
Zinc	-0.30 mg/kg	all soil samples below 3.0 mg/kg

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony (27%) was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

The Matrix Spike recovery for soils for Thallium (68%) was below the lower control limits (<75% but >30%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recovery for Chromium (131%) was abvoe the upper control limits (>125%). All positive results are qualified as estimated, "J".

Laboratory Duplicate Analysis

Specific Finding

The duplicate analysis for Selenium was less than 2 times the CRDL. No qualification is necessary.

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ30301	74
Antimony	040MZ30701	76
Antimony	040MZ31101	84
Antimony	040MZ40901	66
Antimony	041M120201	69

The post digestion spike recovery for GFAA was above the upper control limits. All positive results for the listed samples below are qualified as estimated, "J".

Element	Sample IDs	% recoveries
Antimony	040MZ30101	135
Antimony	041M570101	134
Antimony	041MZ20201	118

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 71.4 mg/kg	Na.	+/U	J/UJ
all soil samples below 3.0 mg/kg	Zn.		
all soil samples	Sb.	+	J
		U	R
all soil samples	Tl.	+/U	J/UJ
all soil samples	Cr.	+	J
040MZ30301, 040MZ30701, 040MZ31101, 040MZ40901 and 041M120201.	Sb.	+/U	J/UJ
040MZ30101, 041M570101 and 041MZ20201.	Sb.	+	J
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	Z31001
Date:	March 12, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	December 1 - 5, 1995
Number of Samples:	3 Aqueous Sample(s) with 0 MS/MSD(s) 22 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level III
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Swyson
for Eugene M. Watson, Vice President

3-13-96
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# Z31001

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/C	
040TM02001	WATER	X							
040TM02101	WATER	X							
040TM02201	WATER	X							
040MZ31001	SOIL		X		X		X		X
040MZ31201	SOIL		X		X		X		X
040MZ31801	SOIL		X		X		X		X
040MZ40301	SOIL		X		X		X		X
040MZ40601	SOIL		X		X		X		X
040NZ40601	SOIL		X		X		X		X
040MZ41001	SOIL		X		X		X		X
040MZ41101	SOIL		X		X		X		X
040MZ41201	SOIL		X		X		X		X
040MZ41301	SOIL		X		X		X		X
040MZ41401	SOIL		X		X		X		X
040MZ41601	SOIL		X		X		X		X
040MZ41701	SOIL		X		X		X		X
040MZ50101	SOIL		X		X		X		X
040MZ50201	SOIL		X		X		X		X
040MZ50301	SOIL		X		X		X		X
040MZ50401	SOIL		X		X		X		X
040MZ50501	SOIL		X		X		X		X
040MZ50601	SOIL		X		X		X		X
040MZ52501	SOIL		X		X		X		X
040MZ52701	SOIL		X		X		X		X
040MZ53101	SOIL		X		X		X		X
Total Billable Samples (Water/Soil)		3	22	0	22	0	22	0	22

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide w/PCB's
TAL/CN = CLP Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results.

SDG # Z31001

A validation was performed on the Volatile Data from SDG Z31001. The data was evaluated based on the following parameters.

- * Data Completeness
- * Holding Times
- * GC/MS Tuning
- * Calibrations
- * Internal Standard Performance
- Blanks
- * Surrogate Recoveries
- * Laboratory Control Samples
- * Field Duplicates
- * Compound Identification /Quantitation

* - All criteria were met for this parameter

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKCA	Methylene chloride	2J	20
VBLKCB	Methylene chloride	3J	30
VBLKCC	methylene chloride	1J	10
VBLKCD	methylene chloride	3J	30

Method Blank (continued)

Samples	Compound	Qualification
0410MZ31001 040MZ31201 040MZ31801 040MZ40301 040MZ41101 040MZ41201 040MZ41301 040MZ50401 040MZ53101 040MZ50601	methylene chloride	CRQL
040MZ41401 040MZ50101 040MZ50501 040MZ52501 040MZ52701 040MZ41001 040MZ50201 040MZ50301	methylene chloride	U

Trip Blank

Associated blank	Compound	Concentration	Action Level
040TM02201	acetone	17B	170
040TM02101	acetone	12B	120
040TM02001	acetone	14B	140
	Methylene chloride	6BJ	60

Samples	Compound	Qualification
040MZ41001 040MZ41101	acetone	U

Trip Blank (continued)

Samples	Compound	Qualification
040MZ50301 040MZ50601 040MZ41401 040MZ50101 040MZ50501 040MZ52701 040MZ50401 040MZ41201 040MZ41301 040MZ50201 040MZ31001	acetone	U
040MZ40601	methylene chloride	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
0410MZ31001	methylene chloride	+	CRQL
040MZ31201			
040MZ31801			
040MZ40301			
040MZ41101			
040MZ41201			
040MZ41301			
040MZ50401			
040MZ53101			
040MZ50601			
040MZ41401	methylene chloride	+	U
040MZ50101			
040MZ50501			
040MZ52501			
040MZ52701			
040MZ41001			
040MZ50201			
040MZ50301			
040MZ41001	acetone	+	U
040MZ41101			
040MZ50301			
040MZ50601			
040MZ41401			
040MZ50101			
040MZ50501			
040MZ52701			
040MZ50401			
040MZ41201			
040MZ41301			
040MZ50201			
040MZ31001			
040MZ40601	methylene chloride	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z31001

A validation was performed on the Semivolatile Data from SDG Z31001. The data was evaluated based on the following parameters.

*	•	Data Completeness
	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Holding Times

The following sample had extractions that exceeded the method criteria of fourteen (14) days from date sampled. Qualifications are required.

Specific Find:

040MZ50401 exceeded holding time by three (3) days. Qualify all positive results as estimated (J).

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Specific Finding:

The continuing calibration, AI867, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ31201	2,4-dinitrophenol (53.0%)
040MZ31801	
040MZ40301	
040MZ41601	
040MZ40601	

The continuing calibration, AI987, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ50601	2,4-dinitrophenol (60.6%)
040MZ41401	

The continuing calibration, IF551, contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

040MZ41701	4-chloroaniline (311.9%)
040MZ50101	
040MZ50501	
040MZ52501	
040MZ52701	
040MZ52701	
040MZ53101	
040MZ31001	
040NZ40601	

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

Method Blanks

Associated blank	Compound	Concentration	Action Level
SBLKAY	bis(2ethylhexyl)phthalate	49J	490
SBLKAC	bis(2ethylhexyl)phthalate	40J	400
SBLKID	bis(2ethylhexyl)phthalate	55J	550
SBLKJQ	bis(2ethylhexyl)phthalate	52J	520

Samples	Compound	Qualification
040MZ31201	bis(2ethylhexyl)phthalate	CRQL
040MZ31801		
040MZ40301		
040MZ40601		
040MZ41401		
040MZ41601		
040MZ41001		
040MZ41101		
040MZ41201		
040MZ41301		
040MZ50201		
040MZ50301		
040MZ50601		
040MZ31001		
040MZ41401		
040MZ50101		
040MZ50501		
040MZ52501		
040MZ52701		
040MZ53101		
040NZ40601		
040MZ50401		

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ50401	All analytes	+	J
040MZ31201	2,4-dinitrophenol (53.0%)	+/-	J/UJ
040MZ31801			
040MZ40301			
040MZ41601			
040MZ40601			
040MZ50601	2,4-dinitrophenol (60.6%)	+/-	J/UJ
040MZ41401			
040MZ41701	4-chloroaniline (311.9%)	+/-	J/R
040MZ50101			
040MZ50501			
040MZ52501			
040MZ52701			
040MZ52701			
040MZ53101			
040MZ31001			
040NZ40601			
040MZ31201	bis(2ethylhexyl)phthalate	+	CRQL
040MZ31801			
040MZ40301			
040MZ40601			
040MZ41401			
040MZ41601			
040MZ41001			
040MZ41101			
040MZ41201			
040MZ41301			
040MZ50201			
040MZ50301			
040MZ50601			
040MZ31001			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ41401	bis(2ethylhexyl)phthalate	+	CRQL
040MZ50101			
040MZ50501			
040MZ52501			
040MZ52701			
040MZ53101			
040NZ40601			
040MZ50401			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z31001

A validation was performed on the Pesticide/Aroclor Data from SDG Z31001. The data was evaluated based on the following parameters:

*	•	Data Completeness
	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Holding Times

The analysis holding times were exceeded for many samples.

Holding Times, Continued

Specific Findings

The following samples exceeded the analysis holding time by three (3) to four (4) days. It is the professional opinion of the data validator that the positive results should be qualified as estimated, J.

040MZ31001
040MZ31801
040MZ40301
040MZ40601
040NZ40601
040MZ41401
040MZ41601
040MZ41701
040MZ50401
040MZ50501
040MZ52501
040MZ52701

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptably linear for all compounds.

Specific Findings

The initial calibration of 1/11/96 contained compounds with %RSDs greater than 20%. For the samples and the non-compliant compound listed below, all positive results are qualified as estimated, J, and all non-detect results are qualified as estimated, UJ.

All samples	Alpha-BHC (20.2%/21.0%)
	Delta-BHC (21.2%/21.1%)

Continuing Calibrations

One (1) continuing calibration standard exhibited %Ds above the QC limits.

Specific Finding

The continuing calibration of 01/19/96 16:27 exhibited %Ds greater than 25%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

040MZ41701	4,4'-DDT (-45.8%/-38.5%)
040MZ50101	Methoxychlor (-36.5%/-27.5%)
040MZ50401	
040MZ52701	
040MZ41301	
040MZ50501	
040MZ52501	
040MZ40301	
040MZ31201	
040MZ40601	
040MZ53101	
040NZ40601	
040MZ41401	
040MZ31001	

Surrogate Recoveries

One (1) sample exhibited a non-compliant TCX recovery.

Specific Finding

The sample listed below exhibited a high TCX recovery. The positive results are qualified as estimated, J.

Sample ID	Surrogate	% Recovery
040MZ31001	TCX-2	152%

Analyte Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 30% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ31001 040MZ31801 040MZ40301 040MZ40601 040NZ40601 040MZ41401 040MZ41601 040MZ41701 040MZ50401 040MZ50501 040MZ52501 040MZ52701	ALL	+	J
All samples	Alpha-BHC Delta-BHC	+/-	J/UJ
040MZ41701 040MZ50101 040MZ50401 040MZ52701 040MZ41301 040MZ50501 040MZ52501 040MZ40301 040MZ31201 040MZ40601 040MZ53101 040NZ40601 040MZ41401 040MZ31001	4,4'-DDT Methoxychlor	+/-	J/UJ
040MZ31001	ALL	+	J
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z31001

A validation was performed on the Metals Data from SDG Z31001. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	10.6 mg/kg	all soil samples below 53.0 mg/kg
Antimony	1.55 mg/kg	no impact
Arsenic	0.21 mg/kg	all soil samples below 1.05 mg/kg
Calcium	13.4 mg/kg	no impact
Iron	9.79 mg/kg	no impact

Lead	0.27 mg/kg	all soil samples below 1.35 mg/kg
Selenium	0.33 mg/kg	all soil samples below 1.65 mg/kg
Silver	0.61 mg/kg	all soil samples below 3.05 mg/kg
Zinc	0.33 mg/kg	all soil samples below 1.65 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Chromium	-0.86 mg/kg	all soil samples below 8.6 mg/kg
Copper	-0.56 mg/kg	all soil samples below 5.6 mg/kg
Manganese	-0.12 mg/kg	all soil samples below 1.20 mg/kg
Thallium	-0.63 mg/kg	all soil samples below 6.3 mg/kg
Vanadium	-0.23 mg/kg	all soil samples below 2.3 mg/kg

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony (18%) was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

Laboratory Duplicate Analysis

Specific Finding

The RPDs for Chromium, Lead and for Zinc the results were below 2 times the CRDL. No qualification is required.

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ40601	52

Antimony	040MZ41401	47
Antimony	040MZ50401	54
Antimony	040MZ50501	74
Antimony	040MZ52501	64
Antimony	040MZ52701	56
Antimony	040MZ53101	63
Antimony	040MZ40601	71
Antimony	040MZ41001	67
Antimony	040MZ41101	52
Antimony	040MZ41201	75
Antimony	040MZ41301	54
Antimony	040MZ50301	81
Antimony	040MZ50601	76

The post digestion spike recovery for GFAA was above the upper control limits. All positive results for the listed samples below are qualified as estimated, "J".

Element	Sample IDs	% recoveries
Antimony	040MZ31001	149
Antimony	040MZ31201	130
Antimony	040MZ31801	143
Antimony	040MZ40301	121

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All soil samples below 53.0 mg/kg	Al.	+	U
all soil samples below 1.05 mg/kg	As.		
all soil samples below 1.35 mg/kg	Pb.		
all soil samples below 1.65 mg/kg	Se.		
all soil samples below 3.05 mg/kg	Ag.		
all soil samples below 1.65 mg/kg	Zn.		
all soil samples below 8.6 mg/kg	Cr.	+/U	J/UJ
all soil samples below 5.6 mg/kg	Cu.		
all soil samples below 1.2 mg/kg	Mn.		
all soil samples below 6.3 mg/kg	Tl.		
all soil samples below 2.3 mg/kg	V.		
all soil samples	Sb.	+	J
		U	R
040MZ40601, 040MZ41401, 040MZ50401, 040MZ50501, 040MZ52701, 040MZ53101, 040MZ41001, 040MZ41101, 040MZ41201, 040MZ41301, 040MZ52501, 040MZ50301 AND 040MZ50601.	Sb.	+/U	J/UJ
040MZ31001, 040MZ3120, 040MZ31801 and 040MZ40301.	Sb.	+	J
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	Z41901
Date:	February 7, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	November 13 - 14, 1995
Number of Samples:	3 Aqueous Sample(s) with 0 MS/MSD(s) 17 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Scarpa
Eugene M. Watson, Vice President

2-12-96.
Date

6716 Mexico Road · St. Peters, MO 63376
(314) 928-9533 · (314) 278-1828 · Fax (314) 278-2709

SDG# Z41901

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040TM01201	WATER	X							
040TM01301	WATER	X							
040TM01401	WATER	X							
040NZ40801	SOIL		X		X		X		X
040MZ41901	SOIL		X		X		X		X
040MZ42001	SOIL		X		X		X		X
040MZ53901	SOIL		X		X		X		X
040MZ54101	SOIL		X		X		X		X
040MZ54201	SOIL		X		X		X		X
040MZ54301	SOIL		X		X		X		X
040MZ54401	SOIL		X		X		X		X
040MZ54501	SOIL		X		X		X		X
040MZ60101	SOIL		X		X		X		X
040MZ60301	SOIL		X		X		X		X
040MZ80101	SOIL		X		X		X		X
040MZ90201	SOIL		X		X		X		X
040MZ90301	SOIL		X		X		X		X
040MZ90401	SOIL		X		X		X		X
040MZ90501	SOIL		X		X		X		X
040MZ90601	SOIL		X		X		X		X
Total Billable Samples	(Water/Soil)	3	17	0	17	0	17	0	17

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # Z41901

A validation was performed on the Volatile Data from SDG Z41901. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, CP749, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040NZ40801	carbon disulfide

The continuing calibration, CP875, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040MZ90501	acetone
040MZ54301	
040MZ60101	
040MZ60301	

The continuing calibration, CP749, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ42001	chloroethane

The continuing calibration, CP787, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ90301	chloroethane

Method Blank

Associated blank	Compound	Concentration
VBLKCG	acetone	4J
	methylene chloride	5J
VBLKCI	methylene chloride	2J
	acetone	4J
VBLKCS	methylene chloride	3J
	acetone	8J
VBLKCK	methylene chloride	5J

Samples	Compound	Qualification
040MZ41901 040MZ42001 040MZ80101 040MZ80101MS 040MZ80101MSD 040MZ54301 040MZ60101 040MZ60301 040MZ90501	methylene chloride	U
040NZ40801 040MZ90301 040MZ90201 040MZ90401	methylene chloride	CRQL
040NZ40801	acetone	CRQL

Method Blank (continued)

Samples	Compound	Qualification
040MZ90301 040MZ80101 040MZ90201 040MZ80101MS 040MZ80101MSD 040MZ42001	acetone	U
040MZ41901	acetone	NA

Rinseate Blank

Associated blank	Compound	Concentration
040EM00201	methylene chloride Acetone	4J 33

Samples	Compound	Qualification
040MZ53901	methylene chloride	U
040MZ54101 040MZ54201 040MZ54401 040MZ54501 040MZ90601	methylene chloride	CRQL
040MZ54301 040MZ60101 040MZ60301 040MZ90501	acetone	U

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040NZ40801	carbon disulfide	+	J
040MZ90501 040MZ54301 040MZ60101 040MZ60301	acetone	+	J
040MZ42001 040MZ90301	chloroethane	+/-	J/UJ
040MZ41901 040MZ80101 040MZ80101MS 040MZ80101MSD 040MZ54301 040MZ60101 040MZ60301 040MZ90501	methylene chloride	+	U
040NZ40801 040MZ90301 040MZ90201 040MZ90401 040MZ42001	methylene chloride	+	CRQL
040NZ40801	acetone	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ90301	acetone	+	U
040MZ80101			
040MZ90201			
040MZ80101MS			
040MZ80101MSD			
040MZ42001			
040MZ41901	acetone	+	NA
040MZ54301	acteone	+	U
040MZ60101			
040MZ60301			
040MZ90501			
040MZ53901	methylene chloride	+	U
040MZ54101	methylene chloride	+	CRQL
040MZ54201			
040MZ54401			
040MZ54501			
040MZ90601			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, OLC01.0 10/92; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z41901

A validation was performed on the Semivolatile Data from SDG Z41901. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration,DI733, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040NZ40801	carbazole
	Bis(2ethylhexyl)phthalate

The continuing calibration,DI733, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040NZ40801	di-n-octylphthalte
040MZ41901	
040MZ42001	

The continuing calibration,DI767, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040MZ54201	butylbenzylphthalate
040MZ54301	

The continuing calibration,DI767, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ53901	di-n-octylphthalte
040MZ54101	bis(2ethylhexyl)phthalate
040MZ54201	
040MZ54301	
040MZ54401	
040MZ54501	
040MZ60101	
040MZ60301	

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, IF400, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ80101	4-chloroaniline
040MZ80101MS	bis(2-ethylhexyl)phthalate
040MZ80101MSD	
040MZ90201	
040MZ90301	
040MZ90401	

The continuing calibration, IF400, contained compounds with %Ds greater than 90%, and minimum RRF less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as reject (R).

040MZ80101	2,2'-oxybis(1-chloropropane)
040MZ80101MS	3-nitroaniline
040MZ80101MSD	
040MZ90201	
040MZ90301	
040MZ90401	

Method Blanks

Associated blank	Compound	Concentration
SBLKDE	bis(2ethylhexyl)phthalate	67J
SBLKDO	bis(2ethylhexyl)phthalate	160J
	Butylbenzylphthalate	44J
SBLKJF	bis(2ethylhexyl)phthalate	170J
SBLKIJ	bis(2ethylhexyl)phthalate	130J

Method Blanks (continued)

Samples	Compound	Qualification
040MZ41901	bis(2ethylhexyl)phthalate	CRQL
040MZ42001		
040MZ40801		
040MZ53901		
040MZ54101		
040MZ54201		
040MZ54301		
040MZ54401		
040MZ54501		
040MZ60101		
040MZ60301		
040MZ90501		
040MZ90601		
040MZ80101		
040MZ90201		
040MZ90401		
040MZ54201	butylbenzylphthalate	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 10% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040NZ40801	carbazole Bis(2ethylhexyl)phthalate	+	J
040NZ40801 040MZ41901 040MZ42001	di-n-octylphthalte	+/-	J/UJ
040MZ54201 040MZ54301	butylbenzylphthalate	+	J
040MZ53901 040MZ54101 040MZ54201 040MZ54301 040MZ54401 040MZ54501 040MZ60101 040MZ60301	di-n-octylphthalte bis(2ethylhexyl)phthalate	+/-	J/UJ
040MZ80101 040MZ80101MS 040MZ80101MSD 040MZ90201 040MZ90301 040MZ90401	4-chloroaniline bis(2-ethylhexyl)phthalate	+/-	J/UJ
040MZ80101 040MZ80101MS 040MZ80101MSD 040MZ90201 040MZ90301 040MZ90401	2,2'-oxybis(1-chloropropane) 3-nitroaniline	+/-	J/R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ41901	bis(2ethylhexyl)phthalate	+	CRQL
040MZ42001			
040MZ40801			
040MZ53901			
040MZ54101			
040MZ54201			
040MZ54301			
040MZ54401			
040MZ54501			
040MZ60101			
040MZ60301			
040MZ90501			
040MZ90601			
040MZ80101			
040MZ90201			
040MZ90401			
040MZ54201	butylbenzylphthalate	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results this report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM03.0 Method for the analysis of Pesticides/Aroclors; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z41901

A validation was performed on the Pesticide/Aroclor Data from SDG Z41901. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Initial Calibrations

The initial calibrations analyzed for these samples were not all within the 20% RSD criteria.

Specific Finding

The initial calibration analyzed on 12/02/95 exhibited non-compliant RPDs for two (2) compounds. Reported results in the following samples are qualified as estimated, J/UJ.

All Samples	α-BHC
	4,4'-DDT

Surrogate Recoveries

One (1) sample required qualification due to non-compliant surrogate recoveries.

Specific Findings

The following sample exhibited TCMX recoveries below the QC limit. All positive and non-detect results reported in the sample are qualified as estimated, J/UJ.

040MZ41901

Compound Identification/Quantitation

The Form Is submitted by the laboratory indicated incorrect Concentrated Final Volumes for all samples. The laboratory indicated that the software limitation would not accommodate the correct final volume. The samples were to be calculated based on a final volume of 1.0 ml. Based on this information, calculation verification was possible. The laboratory is sending supporting documentation of the discrepancy which will be forwarded to the client. Several reported results exhibited P flags due to column quantitation %Ds greater than 25%.

Specific Findings

All positive results exhibiting P flags are qualified as estimated, J, due to column quantitation %Ds greater than 25%.

Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 5% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
All Samples	α-BHC 4,4'-DDT	+/-	J/UJ
040MZ41901	All Compounds	+/-	J/UJ
All	All P flagged results	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z41901

A validation was performed on the Metals Data from SDG Z41901. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
*	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Calcium	9.27 mg/kg	no impact
Iron	1.90 mg/kg	no impact
Lead	0.18 mg/kg	all soil samples below 0.90 mg/kg
Zinc	0.64 mg/kg	all soil samples below 3.20 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Thallium	-0.39 mg/kg	all soil samples

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony was below 30%. All non-detect results are rejected and all positive results are qualfied as estimated, "J".

The Matrix Spike recovery for soils for Silver was below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recovery for soils for Lead was above the upper control limits. All positive results are qualified as estimated, "J".

Duplicate Analysis

Specific Finding

The Duplicate Analysis for soils for Calcium was outside the control limits. All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits for all Antimony data but results were rejected for Spike recovery.

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 0.90 mg/kg	Pb.	+	U
all soil samples below 3.20 mg/kg	Zn.		
All soil samples	Sb.	+	J
		U	R
all soil samples	Ag.	+/U	J/UJ
all soil samples	Pb.	+	J
all soil samples	Ca.	+	J
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	Z42101
Date:	February 14, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	NAS Pensacola; Site 40 & 41
Date Sampled:	November 17, 1995
Number of Samples:	4 Aqueous Sample(s) with 0 MS/MSD(s) 11 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Low Volatiles, Volatiles, Low Semivolatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Sykes
for Eugene M. Watson, Vice President

3-4-96
Date

6716 Mexico Road · St. Peters, MO 63376
(314) 928-9533 · (314) 278-1828 · Fax (314) 278-2709

SDG# Z42101

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	LVOA		VOA		LSV		SV		P/P		TAL/C	
041W5A0601	WATER	X				X				X		X	
041W5B0201	WATER	X				X				X		X	
040TM01501	WATER			X									
040MZ42101	SOIL				X				X		X		X
040MZ42201	SOIL				X				X		X		X
040NZ42201	SOIL				X				X		X		X
040MZ42301	SOIL				X				X		X		X
040MZ42401	SOIL				X				X		X		X
041M5A0601	SOIL				X				X		X		X
041M5B0101	SOIL				X				X		X		X
041M5B0201	SOIL				X				X		X		X
041M642301	SOIL				X				X		X		X
041M642401	SOIL				X				X		X		X
041TM00301	WATER			X									
041M642201	SOIL				X				X		X		X
Total Billable Samples	(Water/Soil)	2	0	2	11	2	0	0	11	2	11	2	11

LVOA = CLP Low Volatiles
VOA = CLP Volatiles
LSV = CLP Low Semivolatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # Z42101

A validation was performed on the Volatile Data from SDG Z42101. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within continuing calibration criteria. All RRFs were within calibration criteria. Qualifications are required.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, CQ029, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J)

041M5A0601 acetone

Method Blank

Associated blank	Compound	Concentration
VBLKCQ	methylene chloride	10
VBLKCR	methylene chloride	15
VBLKCS	methylene chloride	13

Samples	Compound	Qualification
040MZ42101 040MZ42201 040MZ42301 040MZ42401 040NZ42201 041M642301	methylene chloride	U
041M5B0101 041M642201 041M642401 041M5A0601	methylene chloride	CRQL

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041M5A0601	acetone	+	J
040MZ42101	methylene chloride	+	U
040MZ42201			
040MZ42301			
040MZ42401			
040NZ42201			
041M642301			
041M5B0101	methylene chloride	+	CRQL
041M642201			
041M642401			
041M5A0601			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results.

SDG # Z42101

A validation was performed on the Volatile Data from SDG Z42101, low concentration. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, FM384, contained compounds with %Ds greater than 25%, but less than 50%, and RRF less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as rejected (R).

041W5A0601	acetone
041W5B0201	2-butanone

The continuing calibration, FM384, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

041W5A0601	2-hexanone
041W5B0201	

Trip Blank

Associated blank	Compound	Concentration
041TM00301	methylene chloride	11

Samples	Compound	Qualification
041W5A0601	methylene chloride	U
041W5A0201		

Compound Identification /Quantitation

Reject E-flagged analytes for sample 041W5B0201, in favor of D-flagged results in diluted sample 041W5B0201DL.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041W5A0601 041W5B0201	acetone 2-butanone	+/-	J/R
041W5A0601 041W5B0201	2-hexanone	+/-	J/UJ
041W5A0601 041W5A0201	methylene chloride	+	U
041W5B0201	All E-flagged results	+	R
041W5B0201DL	All analytes except D-flagged results	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, OLC01.0 10/92; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z42101

A validation was performed on the Semivolatile Data from SDG Z42101, low concentration. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that none of the data requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLC01.8, 3/90 Method; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z42101

A validation was performed on the Semivolatile Data from SDG Z42101. The data was evaluated based on the following parameters:

*	•	Data Completeness
	•	Holding Times
*	•	GC/MS Tuning
	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Internal Standard Performance
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Holding Times

Three (3) samples were extracted outside the extraction holding time.

Specific Finding

The following samples were extracted sixteen (16) days outside the extraction holding time. All positive results are qualified as estimated, J, and all non-detect results are rejected, R.

040MZ42101 040MZ42301 041M642301

Continuing Calibrations

The continuing calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %Ds. All average RRF requirements were met.

Specific Finding

The continuing calibration standard, DJ216 contained compounds with %Ds greater than 50% but less than 90%. For the samples and non-compliant compounds listed below, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

040MZ42101	4-chloroaniline
040MZ42301	3-nitroaniline
041M642301	2,4-dinitrophenol
	4-nitroaniline
	Bis(2-ethylhexyl)phthalate
	Di-n-octylphthalate

The continuing calibration standard, IF285 contained compounds with %Ds greater than 50% but less than 90%. For the samples and non-compliant compounds listed below, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

040NZ42201	2,2'-oxybis(1-chloropropane)
040MZ42401	hexachlorocyclopentadiene
041M5A0601	3-nitroaniline
	2,4-dinitrophenol
	4-nitroaniline
	3,3'-dichlorobenzidine

The continuing calibration standard, IF314 contained compounds with %Ds greater than 50% but less than 90%. For the samples and non-compliant compounds listed below, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

041M642401	hexachlorocyclopentadiene
040MZ42201	3-nitroaniline
041M5B0201	carbazole
041M5B0101	
041M642201	

Continuing Calibrations, continued

Specific Findings

The continuing calibration standard, IF314 contained compounds with %Ds greater than 90%. For the samples and non-compliant compounds listed below, the positive results are qualified as estimated, J, and the non-detect results are rejected, R.

041M642401 2,2'-oxybis(1-chloropropane)

Method Blanks

One (1) of the two (2) method blanks exhibited contamination for bis(2-ethylhexyl)phthalate.

	SBLKIX
bis(2-ethylhexyl)phthalate	110 μg/Kg

Specific Finding

Samples	Contaminant	Qualification
041M5B0101	bis(2-ethylhexyl)phthalate	CRQL
041M5B0201		
041M642201		
041M642401		
040MZ42201		
040NZ42201		

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 5% of data required qualifications. A typographical error was noted on the Form V. The data noted is 12/29/96, but should be 12/29/95.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ42101	4-chloroaniline	+/-	J/UJ
040MZ42301	3-nitroaniline		
041M642301	2,4-dinitrophenol		
	4-nitroaniline		
	Bis(2-ethylhexyl)phthalate		
	Di-n-octylphthalate		
040NZ42201	2,2'-oxybis(1-chloropropane)	+/-	J/UJ
040MZ42401	hexachlorocyclopentadiene		
041M5A0601	3-nitroaniline		
	2,4-dinitrophenol		
	4-nitroaniline		
	3,3'-dichlorobenzidine		
041M642401	hexachlorocyclopentadiene	+/-	J/UJ
040MZ42201	3-nitroaniline		
041M5B0201	carbazole		
041M5B0101			
041M642201			
041M642401	3,3'-oxybis(1-chloropropane)	+/-	J/R
041M5B0101	bis(2-ethylhexyl)phthalate	+B	CRQL
041M5B0201			
041M642201			
041M642401			
040MZ42201			
040NZ42201			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results this report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.8 Method; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z42101

A validation was performed on the Pesticide/Aroclor Data from SDG Z42101. The data was evaluated based on the following parameters:

- * Data Completeness
- * Holding Times
- * GC Performance
- * Calibration
- Blanks
- Surrogate Recoveries
- * Matrix Spike/Matrix Spike Duplicates
- * GPC and Florisil Clean-up Procedures
- * Field Duplicates
- * Compound Identification
- Compound Quantitation

* - All criteria were met for this parameter.

Method Blanks

One (1) method blank exhibited contamination for one (1) target compound.

	PBLK02
endosulfan I	0.24 µg/Kg

Method Blanks, continued

Specific Finding

Samples	Compound	Qualification
040MZ42101	endosulfan I	U
040MZ42201		
040MZ42301		
040MZ42401		
040NZ42201	endosulfan I	CRQL

Surrogate Recoveries

One (1) sample required qualification due to non-compliant surrogate recoveries.

Specific Findings

The following sample exhibited a TCMX recovery below the QC limit. All positive and non-detect results reported in the sample are qualified as estimated, J/UJ.

041M642401

Compound Identification/Quantitation

Several reported results exhibited P flags due to column quantitation %Ds greater than 25%. Single component compounds in samples with reported aroclors should be considered suspect. The Form Is submitted by the laboratory indicated incorrect Concentrated Final Volumes for all samples. The laboratory indicated that the software limitation would not accommodate the correct final volume. The samples were to be calculated based on a final volume of 1.0 ml. Based on this information, calculation verification was possible. Supporting documentation explaining the discrepancy has been received.

Specific Findings

All positive results exhibiting P flags are qualified as estimated, J, due to column quantitation %Ds greater than 25%.

Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 5% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ42101 040MZ42201 040MZ42301 040MZ42401	endosulfan I	+B	U
040NZ42201	endosulfan I	+B	CRQL
041M642401	All Samples	+/-	J/UJ
All	All P flagged results	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z42101

A validation was performed on the Metals Data from SDG Z42101. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
	●	Matrix Duplicates
	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions
	●	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Barium	0.21 mg/kg	all soil samples below 1.05 mg/kg
Calcium	9.14 mg/kg	no impact
Copper	0.81 mg/kg	all soil samples below 4.05 mg/kg
Iron	3.74 mg/kg	no impact
Lead	0.22 mg/kg	all soil samples below 1.1 mg/kg

Selenium	0.36 mg/kg	no impact
Vanadium	0.44 mg/kg	all soil samples below 2.2 mg/kg
Zinc	0.53 mg/kg	all soil samples below 2.65 mg/kg
Aluminum	29.0 ug/l	all water samples below 145 ug/l
Calcium	123. ug/l	no impact
Iron	49.3 ug/l	no impact
Lead	1.32 ug/l	all water samples below 6.6 ug/l
Nickel	17.1 ug/l	all water samples below 85.5 ug/l

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Arsenic	-0.37 mg/kg	all soil samples below 3.7 mg/kg
Sodium	-19.7 mg/kg	no impact
Arsenic	-2.28 ug/l	all water samples
Chromium	-8.44 ug/l	all water samples
Potassium	-138. ug/l	all water samples below 1380 ug/l
Silver	-6.94 ug/l	all water samples
Sodium	-124. ug/l	no impact

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

Tha Matrix Spike recovery for soils for Antimony was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

The Matrix Spike recoveries for soils for Lead and Silver were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recovery for soils for Selenium was above the upper control limits. All positive results are qualified as estimated, "J".

Duplicate Analysis

Specific Finding

The Duplicate analysis for Lead was outside the control limits. All positive results are qualified as estimated, "J". The field duplicate for Calcium was greater than 50%. All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ42101	64
Antimony	040MZ42201	50
Antimony	040NZ42201	76
Antimony	040MZ42401	77
Antimony	041M5B0101	77
Antimony	041M5B0201	72
Antimony	041M642201	74
Antimony	041M642301	66

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 1.05 mg/kg	Ba.	+	U
all soil samples below 4.05 mg/kg	Cu.		
all soil samples below 1.1 mg/kg	Pb.		
all soil samples below 2.2 mg/kg	V.		
all soil samples below 2.65 mg/kg	Zn.		
all water samples below 145 ug/l	Al.		
all water samples below 6.6 ug/l	Pb.		
all water samples below 85.5 ug/l	Ni.		
all soils samples below 197 mg/kg	Na.	+/U	J/UJ
all water samples	As.		
all water samples	Cr.		
all water samples	Ag.		
all water samples below 1380 ug/l	K.		
all soil samples	Sb.	+	J
		U	R
all soil samples	Pb and Ag.	+/U	J/UJ
all soil samples	Se.	+	J
all soil samples	Pb.	+	J
040MZ42101, 42201, NZ42201, MZ42401, 041M5B0101, 201, 642201 and 301.	Sb.	+/U	J/UJ
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	Z50801
Date:	March 29, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	January 10 - 12, 1996
Number of Samples:	4 Aqueous Sample(s) with 0 MS/MSD(s) 16 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides w/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Seafoss
Eugene M. Watson, Vice President

4-2-96
Date.

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# Z50801

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040EM00801	WATER	X		X		X		X	
040FM00801	WATER	X		X		X		X	
040TM03101	WATER	X							
040TM03201	WATER	X							
040MZ20101	SOIL		X		X		X		X
040MZ20201	SOIL		X		X		X		X
040MZ20301	SOIL		X		X		X		X
040MZ20401	SOIL		X		X		X		X
040MZ21301	SOIL		X		X		X		X
040MZ21401	SOIL		X		X		X		X
040MZ21501	SOIL		X		X		X		X
040MZ22001	SOIL		X		X		X		X
040MZ22201	SOIL		X		X		X		X
040MZ50801	SOIL		X		X		X		X
040MZ50901	SOIL		X		X		X		X
040MZ51001	SOIL		X		X		X		X
040MZ51101	SOIL		X		X		X		X
040MZ51201	SOIL		X		X		X		X
040MZ51301	SOIL		X		X		X		X
040MZ51401	SOIL		X		X		X		X
Total Billable Samples	(Water/Soil)	4	16	2	16	2	16	2	16

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG #Z50801

A validation was performed on the Volatile Data from SDG Z50801. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, BU399, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040MZ51301 acetone (29.1%)

The continuing calibration, BU399, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ21401 2-butanone (56.5%)
040MZ21501

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blank

Associated blank	Compound	Concentration	Action Level
VBLKCX	acetone	8J	80

Samples	Compound	Qualification
040MZ21401 040MZ21501	acetone	U

Trip Blank

Associated blank	Compound	Concentration	Action Level
041TM03101	acetone	10	100
	Methylene chloride	2J	20
040TM03201	acetone	8J	80
	Methylene chloride	5J	50

Samples	Compound	Qualification
040MZ50801	methylene chloride	CRQL
040MZ50901		
040MZ51001		
040MZ51101		
040MZ51201		
040MZ21301		
040MZ51201	acetone	CRQL
040MZ51401	acetone	U
040MZ20101		
040MZ20201		
040MZ20301		

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 10% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ51301	acetone	+	J
040MZ21401 040MZ21501	2-butanone	+/-	J/UJ
040MZ21401 040MZ21501	acetone	+	U
040MZ50801 040MZ50901 040MZ51001 040MZ51101 040MZ51201 040MZ21301	methylene chloride	+	CRQL
040MZ51201	acetone	+	CRQL
040MZ51401 040MZ20101 040MZ20201 040MZ20301	acetone	+	U

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z50801

A validation was performed on the Semivolatile Data from SDG Z50801. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within %D and RRF continuing calibration criteria. Qualifications are required.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DJ540, contained compounds with %Ds greater than 50% an less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040MZ20101 040MZ20201 040MZ20301 040MZ20401	4,6-dinitro-2-methylphenol (67.6%)

Blanks

The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X and 10X criteria to field samples.

Method Blanks

Associated blank	Compound	Concentration	Action Level
SBLKDH	bis(2-ethylhexyl)phthalate	33J	330

Samples	Compound	Qualification
040MZ20201 040MZ20301 040MZ20401	bis(2-ethylhexyl)phthalate	CRQL

Rinseate Blanks

Associated blank	Compound	Concentration	Action Level
040EM00801	bis(2-ethylhexyl)phthalate	7J	70

Samples	Compound	Qualification
040MZ21301	bis(2-ethylhexyl)phthalate	CRQL
040MZ21401		
040MZ21501		
040MZ22001		
040MZ22201		
040MZ50801		
040MZ50901		
040MZ51001		
040MZ51101		
040MZ51201		
040MZ51301		
040MZ51401		

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ20101 040MZ20201 040MZ20301 040MZ20401	4,6-dinitro-2-methylphenol	+/-	J/UJ
040MZ20201 040MZ20301 040MZ20401	bis(2-ethylhexyl)phthalate	+	CRQL
040MZ21301 040MZ21401 040MZ21501 040MZ22001 040MZ22201 040MZ50801 040MZ50901 040MZ51001 040MZ51101 040MZ51201 040MZ51301 040MZ51401	bis(2-ethylhexyl)phthalate	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM01.9 Method; the National Functional Guidelines for Organic Data Validation, June 1991; and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z50801

A validation was performed on the Pesticide/Aroclor Data from SDG Z50801. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Continuing Calibrations

One (1) continuing calibration standard exhibited %Ds above the QC limits.

Continuing Calibrations, Continued

Specific Finding

The continuing calibration of 02/02/96 (21:09/21:45) exhibited %Ds greater than 25%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

040MZ20101	4,4'-DDT (-30.8%)
040MZ20201	4,4'-DDD (40.2%)
040MZ20301	Delta-BHC (27.5%)
040MZ20401	Endrin Aldehyde (26.2%)
040MZ21301	
040MZ21401	
040MZ21501	
040MZ22001	
040MZ22201	
040MZ50801	
040MZ50901	
040MZ51001	
040MZ51101	
040MZ51201	
040MZ51301	
040MZ51401	

Analyte Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 25%.

Specific Findings

The positive results reported in all samples which exhibit column quantitation differences greater than 25% are qualified as estimated, J.

System Performance and Overall Assessment

Overall performance was acceptable. The data reviewer estimates less than 20% of the data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ20101	4,4'-DDT	+/-	J/UJ
040MZ20201	4,4'-DDD		
040MZ20301	Delta-BHC		
040MZ20401	Endrin Aldehyde		
040MZ21301			
040MZ21401			
040MZ21501			
040MZ22001			
040MZ22201			
040MZ50801			
040MZ50901			
040MZ51001			
040MZ51101			
040MZ51201			
040MZ51301			
040MZ51401			
ALL	ALL P >25%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z50801

A validation was performed on the Metals Data from SDG Z50801. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	12.2 mg/kg	no impact
Antimony	0.45 mg/kg	no impact
Calcium	1.61 mg/kg	no impact
Iron	3.88 mg/kg	no impact
Lead	0.12 mg/kg	all soil samples below 0.6 mg/kg

Sodium	9.23 mg/kg	no impact
Zinc	1.09 mg/kg	all soil samples below 5.45 mg/kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

Matrix Spike Recovery

Specific Finding

The Matrix Spike recoveries for soils for Antimony (49%) and Selenium (71%) were below the lower control limits (<75% but >30%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits. All positive and non-detect results for the listed samples below are qualified as estimated, "J" or "UJ".

Element	Sample IDs	% recoveries
Antimony	040MZ22001	65
Antimony	040MZ22201	52
Antimony	040MZ20101	74
Antimony	040MZ20201	80
Antimony	040MZ20301	82

The post digestion spike recovery for GFAA was above the upper control limits. All positive results for the listed samples below are qualified as estimated, "J".

Element	Sample IDs	% recoveries
Antimony	040MZ21501	120
Antimony	040MZ51201	116
Antimony	040MZ20401	127

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 0.6 mg/kg	Pb.	+	U
all soil samples below 5.45 mg/kg	Zn.		
all soil samples	Sb and Se.	+/U	J/UJ
040MZ22001, 22201, 20101, 20201 and 20301.	Sb.	+/U	J/UJ
040MZ21501, 51201 and 20401.	Sb.	+	J
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	Z61101
Date:	February 7, 1996
Client Name:	Ensafe/Allen & Hoshall
Project/Site Name:	Pensacola
Date Sampled:	November 8 - 10, 1995
Number of Samples:	4 Aqueous Sample(s) with 0 MS/MSD(s) 20 Non-aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	CEIMIC Corporation
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level IV
Method(s) Utilized:	CLP Multimedia SOW
Analytical Fractions:	Volatiles, Semivolatiles, Pesticides/PCB's, Metals w/Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user in urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Eugene M. Watson, Vice President

14 Feb 96
Date

6716 Mexico Road · St. Peters, MO 63376
(314) 928-9533 · (314) 278-1828 · Fax (314) 278-2709

SDG# Z61101

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

Ensafe ID	Matrix	VOA		SV		P/P		TAL/CN	
040EM00301	WATER	X		X		X		X	
040FM00301	WATER	X		X		X		X	
040TM01001	WATER	X							
040TM01101	WATER	X							
040MZ40101	SOIL		X		X		X		X
040MZ40201	SOIL		X		X		X		X
040MZ40401	SOIL		X		X		X		X
040MZ40701	SOIL		X		X		X		X
040MZ40801	SOIL		X		X		X		X
040MZ60401	SOIL		X		X		X		X
040MZ60501	SOIL		X		X		X		X
040MZ60601	SOIL		X		X		X		X
040MZ60701	SOIL		X		X		X		X
040MZ60801	SOIL		X		X		X		X
040MZ60901	SOIL		X		X		X		X
040MZ61001	SOIL		X		X		X		X
040MZ61101	SOIL		X		X		X		X
040MZ61201	SOIL		X		X		X		X
040MZ61301	SOIL		X		X		X		X
040MZ61401	SOIL		X		X		X		X
040MZ61501	SOIL		X		X		X		X
040MZ61601	SOIL		X		X		X		X
040MZ61701	SOIL		X		X		X		X
040MZ61801	SOIL		X		X		X		X
Total Billable Samples	(Water/Soil)	4	20	2	20	2	20	2	20

VOA = CLP Volatiles
SV = CLP Semivolatiles
P/P = CLP Pesticide/PCB's
TAL/CN = CLP Metals w/cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP OLC01.0, 10/92 SOW; the National Functional Guidelines for Organic Data Review, June 1991, and DQO Level IV. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # Z61101

A validation was performed on the Volatile Data from SDG Z61101. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Samples
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds and RRFs that were not within continuing calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, CP694, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J)

040MZ40101	carbon disulfide
040MZ61301	

The continuing calibration, CP716, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J)

040MZ40101RE	carbon disulfide
040MZ40401	
040MZ40801	
040MZ60501	
040MZ61601	

040MZ40101RE	acetone
040MZ40401	
040MZ40801	
040MZ60501	
040MZ61601	
040MZ61801	

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria.

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated (UJ).

040MZ40101RE	chlorobenzene-d_5

Internal Standards (continued)

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated (UJ).

040MZ40101	1,4-difluorobenzene chlorobenzene-d_5

Method Blank

Associated blank	Compound	Concentration
VBLKBN	methylene chloride	5J
VBLKCD	methylene chloride	5J
VBLKCE	methylene chloride	3J

Samples	Compound	Qualification
040MZ60401 040MZ60501 040MZ60601 040MZ60701 040MZ60801 040MZ60901 040MZ40101 040MZ61301 040MZ61401 040MZ61701 040MZ40101RE 040MZ40201 040MZ40401 040MZ40801 040MZ61001 040MZ61601	methylene chloride	CRQL

Method Blanks (continued)

Samples	Compound	Qualification
040MZ61801	methylene chloride	CRQL
040MZ61201 040MZ61501 040MZ40701 040MZ61101	methylene chloride	U

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 10% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.
U =	The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ40101 040MZ61301	carbon disulfide	+	J
040MZ40101RE 040MZ40401 040MZ40801 040MZ60501 040MZ61601	carbon disulfide	+	J
040MZ40101RE 040MZ40401 040MZ40801 040MZ60501 040MZ61601 040MZ61801	acetone	+	J
040MZ40101RE	chlorobenzene-d_5	+/-	J/UJ
040MZ40101	1,4-difluorobenzene chlorobenzene-d_5	+/-	J/UJ
040MZ60401 040MZ60501 040MZ60601 040MZ60701 040MZ60801 040MZ60901 040MZ40101 040MZ61301 040MZ61401 040MZ61701 040MZ40101RE 040MZ40201	methylene chloride	+	CRQL

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ61801	methylene chloride	+	CRQL
040MZ40401			
040MZ40801			
040MZ61001			
040MZ61601			
040MZ61201	methylene chloride	+	U
040MZ61501			
040MZ40701			
040MZ61101			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ40101	carbon disulfide	+	J
040MZ61301			
040MZ40101RE			
040MZ40401			
040MZ40801			
040MZ60501			
040MZ61601			
040MZ40101RE	acetone	+	J
040MZ40401			
040MZ40801			
040MZ60501			
040MZ61601			
040MZ61801			
040MZ40101RE	All analytes associated chlorobenzene-d_5	+/-	J/UJ
040MZ40101	All analytes associated 1,4-difluorobenzene chlorobenzene-d_5	+/-	J/UJ
040MZ60401	methylene chloride	+	CRQL
040MZ60501			
040MZ60601			
040MZ60701			
040MZ60801			
040MZ60901			
040MZ40101			
040MZ61301			
040MZ61401			
040MZ61701			
040MZ40101RE			
040MZ40201			

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QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS
Page 2

SAMPLE ID	ANALYTE ID	DL	QL
040MZ61801	methylene chloride	+	CRQL
040MZ40401			
040MZ40801			
040MZ40801MS			
040MZ40801MSD			
040MZ61001			
040MZ61601			
040MZ61201	methylene chloride	+	U
040MZ61501			
040MZ40701			
040MZ61101			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90; National Functional Guidelines for Organic Data Review, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # Z61101

A validation was performed on the Semivolatile Data from SDG Z61101. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
	•	Internal Standard Performance
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, DI733, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040MZ60401	di-n-octylphthalate
040MZ60501	
040MZ60601	
040MZ60701	
040MZ60801	
040MZ60901	
040MZ61001	

The continuing calibration, IF225, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040MZ40101	2,2'-oxybis(1-chloropropane)
040MZ40201	3,3'-dichlorobenzidine
040MZ40401	bis(2-ethylhexyl)phthalate
040MZ40701	
040MZ40801	
040MZ40801	
040MZ40801	
040MZ61701	
040MZ61801	

The continuing calibration, JF611, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040EM00301	3,3'-dichlorobenzidine
040FM00301	

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, JF630, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

040EM00301RE	3,3'-dichlorobenzidine
040FM00301RE	
040MZ61101	
040MZ61201	
040MZ61301	
040MZ61401	
040MZ61501	
040MZ61601	

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria.

Specific Finding:

The Samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated (UJ).

040EM00301	chrysene-d_{12}
040EM00301RE	
040FM00301RE	
040FM00301	chrysene-d_{12}
	perylene-d_{12}

Method Blanks

Associated blank	Compound	Concentration
SBLKDE	bis(2-ethylhexyl) phthalate	67J
SBLKIQ	di-n-butylphthalate bis(2-ethylhexyl) phthalate	23J 62J
SBLKIR	bis(2-ethylhexyl) phthalate	65J
SBLKJT	bis(2-ethylhexyl) phthalate	88J
SBLKJX	bis(2-ethylhexyl) phthalate	13

Samples	Compound	Qualification
All samples	bis(2-ethylhexyl) phthalate	CRQL
040MZ61701 040MZ61801	di-n-butylphthalate	CRQL

Compound Identification/Quantitation

Specific Finding:

Reject all results (R) for samples 040EM00301RE and 040FM00301, due to non compliant internal standard areas and/or non compliant surrogate recoveries.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ60401	di-n-octylphthalate	+/-	J/UJ
040MZ60501			
040MZ60601			
040MZ60701			
040MZ60801			
040MZ60901			
040MZ61001			
040MZ40101	2,2'-oxybis(1-chloropropane)	+/-	J/UJ
040MZ40201	3,3'-dichlorobenzidine		
040MZ40401	bis(2-ethylhexyl)phthalate		
040MZ40701			
040MZ40801			
040MZ40801			
040MZ40801			
040MZ61701			
040MZ61801			
040EM00301	3,3'-dichlorobenzidine	+/-	J/UJ
040FM00301			
040EM00301RE	3,3'-dichlorobenzidine	+/-	J/UJ
040FM00301RE			
040MZ61101			
040MZ61201			
040MZ61301			
040MZ61401			
040MZ61501			
040MZ61601			
	All associated analytes	+/-	J/UJ
040EM00301	chrysene-d_{12}		
040EM00301RE			
040FM00301RE			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040FM00301	All associated analytes chrysene-d_{12} perylene-d_{12}	+/-	J/UJ
All samples	bis(2-ethylhexyl) phthalate	+	CRQL
040MZ61701 040MZ61801	di-n-butylphthalate	+	CRQL
040EM00301RE 040FM00301	All analytes	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results this report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP OLM03.0 Method for the analysis of Pesticides/Aroclors; the National Functional Guidelines for Organic Data Validation, June 1991, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z61101

A validation was performed on the Pesticide/Aroclor Data from SDG Z61101. The data was evaluated based on the following parameters:

*	•	Data Completeness
	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	GPC and Florisil Clean-up Procedures
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Holding Times

Most of the samples reported were re-extracted sixteen (16) to eighteen (18) days outside the extraction holding time. The laboratory did not include an explanation for the re-extract or the initial analysis of the data.

Holding Times, continued

Specific Finding

The following samples were re-extracted sixteen (16) to eighteen (18) days outside the extraction holding time. All positive results are qualified as estimated, J, and all non-detect results are rejected, R.

040MZ40101
040MZ40201
040MZ40701
040MZ60401
040MZ60501
040MZ60601
040MZ60701
040MZ60801
040MZ60901
040MZ61001
040MZ61101
040MZ61201
040MZ61301
040MZ61401
040MZ61501
040MZ61601
040MZ61701
040MZ61801

Initial Calibrations

The initial calibrations analyzed for these samples were not all within the 20% RSD criteria.

Specific Finding

The initial calibration analyzed on 11/28/95 exhibited non-compliant RPDs for two (2) compounds. Reported results in the following samples are qualified as estimated, J/UJ.

040EM00301	α-BHC
040FM00301	δ-BHC
040MZ00401	
040MZ40801	

Continuing Calibrations

One (1) PEM standard exhibited a non-compliant RPD for one (1) compound.

Specific Finding

The PEM standard analyzed 12/18/95 at 2127 on the DB608 column exhibited a non-compliant RPD for one (1) compound. For the following samples and non-compliant compounds, the positive and non-detect results are qualified as estimated, J/UJ.

040MZ40101	methoxychlor
040MZ40201	
040MZ40701	

Surrogate Recoveries

Six (6) samples required qualification due to non-compliant surrogate recoveries. DCB co-eluted with a non-target compound in one (1) of the method blanks on column 1 (DB-608). The recovery was inflated. This was not noted in the field samples associated with the method blank.

Specific Findings

The following sample exhibited TCMX and/or DCB recoveries below the QC limit. All positive and non-detect results reported in the sample are qualified as estimated, J/UJ.

040MZ40401
040MZ4080
040MZ40101
040MZ61301
040MZ61801
040MZ60601

Compound Identification/Quantitation

The Form Is submitted by the laboratory indicated incorrect Concentrated Final Volumes for all samples. The laboratory indicated that the software limitation would not accommodate the correct final volume. The samples were to be calculated based on a final volume of 1.0 ml. Based on this information, calculation verification was possible. The laboratory is sending supporting documentation of the discrepancy which will be forwarded to the client. Several reported results exhibited P flags due to column quantitation %Ds greater than 25%.

Specific Findings

All positive results exhibiting P flags are qualified as estimated, J, due to column quantitation %Ds greater than 25%.

Overall Assessment

Overall performance was acceptable. However, many of the sample results were qualified/rejected because of grossly exceeded extraction holding times.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
040MZ40101	All compounds	+/-	J/R
040MZ40201			
040MZ40701			
040MZ60401			
040MZ60501			
040MZ60601			
040MZ60701			
040MZ60801			
040MZ60901			
040MZ61001			
040MZ61101			
040MZ61201			
040MZ61301			
040MZ61401			
040MZ61501			
040MZ61601			
040MZ61701			
040MZ61801			
040EM00301	α-BHC	+/-	J/UJ
040FM00301	δ-BHC		
040MZ00401			
040MZ40801			
040MZ40101	methoxychlor	+/-	J/UJ
040MZ40201			
040MZ40701			
040MZ40401	All compounds	+/-	J/UJ
040MZ4080			
040MZ40101			
040MZ61301			
040MZ61801			
040MZ60601			

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
All Samples	All P flagged	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # Z61101

A validation was performed on the Metals Data from SDG Z61101. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
	•	Serial Dilutions
*	•	MSAs

* - All criteria were met for this parameter.

Preparation and Field Blanks

Specific Finding

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	2.86 mg/kg	no impact
Calcium	8.59 mg/kg	no impact
Iron	1.84 mg/kg	no impact
Potassium	17.7 mg/kg	all soil samples below 88.5 mg/kg
Sodium	4.36 mg/kg	no impact

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U". The field or DI water blanks exhibited contamination but had no impact on the data.

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Mercury	-0.06 mg/kg	all soil samples

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

Specific Finding

The Matrix Spike recovery for soils for Antimony was below 30%. All non-detect results are rejected and all positive results are qualfied as estimated, "J".

The Matrix Spike recoveries for soils for Copper, Manganese and Zinc were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Serial Dilution

Specific Finding

The Serial Dilution for soils for Zinc was outside the control limits. All positive results are qualified as estimated, "J".

MSAs

Specific Finding

The post digestion spike recovery for GFAA was below the lower control limits for all Antimony data but results were rejected for Spike recovery.

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 88.5 mg/kg	K.	+	U
All soil samples	Sb.	+	J
		U	R
all soil samples	Cu, Mn and Zn.	+/U	J/UJ
all soil samples	Zn.	+	J
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

RECEIVED
OCT 13 1997

Data Validation Report

SDG#:	PEN11
Date:	October 8, 1997
Client Name:	EnSafe
Project/Site Name:	Pensacola, Sites 40 & 41
Date Sampled:	August 26-September 3, 1997
Number of Samples:	12 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticide/PCB's, Metals, Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Searfoss
for Paul B. Humburg, President

10-10-97
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) [illegible]-1372 · Fax (314) 930-1335

SDG# PEN11

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	VOA		SVOA		P/P		TAL/CN	
040W2B0701	WATER	X		X		X		X	
040W2B0901	WATER	X		X		X		X	
041W030101	WATER	X		X		X		X	
041W330101	WATER	X		X		X		X	
041W330201	WATER	X		X		X		X	
041W5A0401	WATER	X		X		X		X	
041W5A0501	WATER	X		X		X		X	
041W5A0601	WATER	X		X		X		X	
041R5A0601	WATER	X		X		X		X	
041W750101	WATER	X		X		X		X	
041T082697	WATER	X							
041T082797	WATER	X							
Total Billable Samples	(Water/Soil)	12	0	10	0	10	0	10	0

VOA = Volatiles
SV = Semivolatiles
P/P = Pesticide/PCB's
TAL/CN = Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8240; the National Functional Guidelines for Organic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN11

A validation was performed on the Volatile Data from SDG PEN11. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Internal Standard Performance
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Field QC Blanks

The trip and rinseate blanks associated with these samples exhibited contamination. The samples required qualification. The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X or 10X criteria to field samples.

Field QC Blanks, continued

Associated Blanks	Compound	Conc.	Action Level
040TW09047	carbon disulfide	0.46 μg/L	4.6 μg/L
041E082897	carbon disulfide	0.90 μg/L	9.0 μg/L

Samples	Compound	Qualification
041W330101	carbon disulfide	CRQL
041W5A0401		
041W5A0601		

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
041W330101	carbon disulfide	+	CRQL
041W5A0401			
041W5A0601			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846 8270; the National Functional Guidelines for Organic Data Review, February 1994; and DQO Level III. All comments made within this report should be considered when examining the analytical results.

SDG # PEN11

A validation was performed on the Semivolatile Data from SDG PEN11. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
  Calibrations
* Internal Standard Performance
* Blanks
* Surrogate Recoveries
* Laboratory Control Samples
* Field Duplicates
* Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing Calibrations

The continuing calibrations were acceptable for all average RRFs. All %Ds were not within continuing calibration criteria. Qualifications are required.

Continuing Calibrations (continued)

The continuing calibration, JQ750, contained compounds with %Ds greater than 50% but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

041W030101	2,4-dinitrophenol (64.1%)
041W5A0401	4,6-dinitro-2-methylphenol (58.8%)
041W5A0501	
041W5A0601	
041R5A0601	
041W750101	
041W330101	
041W330201	

System Performance and Overall Assessment

The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
041W030101	2,4-dinitrophenol	+/-	J/UJ
041W5A0401	4,6-dinitro-2-methylphenol		
041W5A0501			
041W5A0601			
041R5A0601			
041W750101			
041W330101			
041W330201			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8080; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN11

A validation was performed on the Pesticide/Aroclor Data from SDG PEN11. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Contractual Non-Compliance

The method requires that all target compounds, including the multi-component compounds, be analyzed with a five (5) point calibration curve. The laboratory analyzed a single point curve for the Aroclors 1221, 1232, 1242, 1248, and 1254. No positive results were reported for the compounds analyzed with a single point calibration, therefore the data did not require qualification.

Method Blanks

One (1) associated method blank exhibited contamination for target compounds and required qualifications. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moistures as associated samples. These factors must be taken into consideration when applying the 5X criteria to field samples. The method blank results were compared to the associated samples.

Blank ID	Compound	Concentration	Action Level
08290-MMB	4,4'-DDD	0.0035 JP µg/L	0.0175 µg/L

The following samples have been qualified for method blank contamination. The qualifications are for all the blanks.

Sample	Compound	Qualification
041W5A0501 041R5A0601 041W750101	4,4'-DDD	CRQL

QC Blanks

The associated QC blank exhibited contamination for target compounds and required qualifications. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moistures as associated samples. These factors must be taken into consideration when applying the 5X criteria to field samples. The QC blank results were compared to the associated samples.

Blank ID	Compound	Concentration	Action Level
041E082897	Heptachlor	0.0020 JBP µg/L	0.01 µg/L

The following sample has been qualified for QC blank contamination. The qualifications are for all the blanks.

Sample	Compound	Qualification
041R5A0601	Heptachlor	CRQL

Surrogate Recoveries

The sample listed below exhibited a DCB recovery less than 10%. The positive results are qualified as estimated, J, and the non-detect results are rejected, UR.

Sample ID	Surrogate	% Recovery
041W750101	DCB-2	6%

Compound Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 40%. The following guidelines were used to qualify the data:

1. No qualifications are required for positive sample results which exhibited column quantitation differences <40%. The "P" flag is removed from the result.

2. The positive sample result which exhibited a column quantitation difference >40%, but ≤100% is qualified as estimated, J.

3. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and is <10X the respective compound CRQL, is qualified as non-detect, U. (All multi-component results are exempt from this rule.)

4. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and >10X the respective compound CRQL, is qualified as presumptively present at an estimated concentration, NJ. (All multi-component results are exempt from this rule.)

5. The positive multi-component pesticide sample result which exhibited a column quantitation difference >100% and <10X the respective multi-component CRQL is qualified as presumptively present at an estimated concentration, NJ.

Compound Identification/Quantitation, Continued

The following samples and compounds have been qualified for high column quantitation %Ds.

Sample ID	Compound	%D	Lab Qual.	HESI Qual.	Ref. #
041W5A0501	Beta-BHC	222.6%	P	U	3
	Gamma-BHC	134.0%	P	U	3
	Dieldrin	117.8%	P	U	3
	4,4'-DDD	233.3%	P	U	3
041W5A0601	Gamma-Chlordane	269.9%	P	U	3
041R5A0601	Alpha-BHC	154.2%	P	U	3
	4,4'-DDD	284.6%	P	U	3
041W750101	Dieldrin	87.1%	P	J	2
	4,4'-DDE	137.9%	P	U	3
	4,4'-DDD	83.9%	P	J	2
041W330101	Dieldrin	30.0%	P		1
040W2B0901	Delta-BHC	111.5%	P	U	3
040W2B0701	Delta-BHC	93.5%	P	J	2
	Gamma-BHC	230.0	P	U	3

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
041W5A0501 041R5A0601 041W750101	4,4'-DDD	+	CRQL
041R5A0601	Heptachlor	+	CRQL
041W750101	ALL	+/-	J/UR
ALL	All P < 40%	+	
ALL	All P > 40% But ≤ 100%	+	J
ALL	single component pests All P > 100% And < 10X CRQL	+	U
ALL	single component pests All P > 100% And > 10X CRQL	+	NJ
ALL	multi-component pests All P> 100% And < 10X CRQL	+	NJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN11

A validation was performed on the Metals and Cyanide Data from SDG PEN11. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
*	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
	•	Post Digestion Spiking

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Beryllium	0.20 ug/l	all water samples below 1.0 ug/l
Lead	1.2 ug/l	all water samples below 6.0 ug/l
Mercury	0.06 ug/l	all water samples 0.3 ug/l

The calibration blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Barium	0.8 ug/l	no impact
Chromium	1.1 ug/l	all water samples below 5.5 ug/l
Manganese	0.9 ug/l	all water samples below 4.5 ug/l
Nickel	2.1 ug/l	all water samples below 10.5 ug/l

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U".

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Arsenic	-5.38 ug/l	all water samples below 53.8 ug/l
Chromium	-0.9 ug/l	all water samples below 9.0 ug/l
Cobalt	-1.17 ug/l	all water samples below 11.7 ug/l
Iron	-20.6 ug/l	all water samples below 206 ug/l
Vanadium	-1.99 ug/l	all water samples below 19.9 ug/l
Cyanide	-4.56 ug/l	all water samples below 45.6 ug/l

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Post Digestion Spiking results

The post digestion spiking for the following samples were below the lower control limits (>10% but <85%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

Analytes	Sample IDs	Recovery
Silver	040W2B0701	60
Silver	040W2B0901	59
Silver	041W330101	80
Thallium	040W2B0701	47
Thallium	040W2B0901	40
Thallium	041W330101	64

"B" qualifier

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All water samples below 1.0 ug/l	Be.	+	U
All water samples below 5.5 ug/l	Cr.		
All water samples below 6.0 ug/l	Pb.		
All water samples below 4.5 ug/l	Mn.		
All water samples below 0.3 ug/l	Hg.		
All water samples below 10.5 ug/l	Ni.		
All water samples below 53.8 ug/l	As.	+/U	J/UJ
All water samples below 9.0 ug/l	Cr.		
All water samples below 11.7 ug/l	Co.		
All water samples below 206 ug/l	Fe.		
All water samples below 19.9 ug/l	V.		
All water samples below 45.6 ug/l	Cn.		
040W2B0701, 040W2B0901 and 041W330101.	Ag and Tl.	+/U	J/UJ
All "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PEN12
Date:	October 14, 1997
Client Name:	EnSafe
Project/Site Name:	Pensacola - Sites 40 & 41
Date Sampled:	August 27-September 3, 1997
Number of Samples:	4 Aqueous Sample(s) with 0 MS/MSD(s) 20 Non-aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticide/PCB's, Metals, Cyanide, Total Organic Carbons

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

for Kimberly S. Shopp
Paul B. Humburg, President

14 October 1997
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# PEN12

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	VOA		SVOA		P/P		TAL		CN		TOC	
040T082997	WATER	X											
040M2B0101	SOIL		X		X		X		X		X		X
040M2B0201	SOIL		X		X		X		X		X		X
040M2B0301	SOIL		X		X		X		X		X		X
040M2B0401	SOIL		X		X		X		X		X		X
040M2B0501	SOIL		X		X		X		X		X		X
040M2B0601	SOIL		X		X		X		X		X		X
040M2B0701	SOIL		X										
040M2B0901	SOIL		X										
040M2B1001	SOIL		X										
040TW09037	WATER	X											
041M030201	SOIL		X		X		X		X		X		X
041M030701	SOIL		X		X		X		X		X		X
041E082897	WATER	X		X		X		X		X			
041T082897	WATER	X											
041M18B101	SOIL		X		X		X		X		X		X
041M330101	SOIL		X		X		X		X		X		X
041M330201	SOIL		X		X		X		X		X		X
041M5A0401	SOIL		X		X		X		X		X		X
041M5A0501	SOIL		X		X		X		X		X		X
041M5A0601	SOIL		X		X		X		X		X		X
041M640601	SOIL		X										
041M750101	SOIL		X		X		X		X		X		X
041N750101	SOIL		X		X		X		X		X		X
Total Billable Samples	(Water/Soil)	4	20	1	16	1	16	1	16	1	16	0	16

VOA = Volatiles
SV = Semivolatiles
P/P = Pesticide/PCB's
TAL = Metals
CN = Cyanide
TOC = Total Organic Carbons

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846, Method 8240; the National Functional Guidelines for Organic Data Review, February 1994, and DQO Level III. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # PEN12

A validation was performed on the Volatile Data from SDG PEN12. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

The continuing calibration, MQ306, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

041M030201RE acetone (28.0)

Compound Identification/Quantitation

Specific Finding:

Do not use results for the samples listed below, in favor of the re-analyzed sample results due to non compliant surrogate recoveries and/or non compliant internal standard areas.

041M030201
041M330101

Do not use results for the re-analyzed samples listed below, due to non compliant internal standard areas.

041M5A601RE
041M640601RE
041N750101RE
040M2B0501RE
040M2B0601RE
040M2B0201RE

System Performance and Overall Assessment

The laboratory did not encounter any large problems. The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D= result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041M030201RE	acetone (28.0)	+	J
041M030201 041M330101	All results	+/-	Do not use
041M5A601RE 041M640601RE 041N750101RE 040M2B0501RE 040M2B0601RE 040M2B0201RE	All results	+/-	Do not use

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846 8270; the National Functional Guidelines for Organic Data Review, February 1994, and DQO Level III. All comments made within this report should be considered when examining the analytical results.

SDG # PEN12

A validation was performed on the Semivolatile Data from SDG PEN12. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
* Calibrations
* Internal Standard Performance
* Blanks
* Surrogate Recoveries
* Laboratory Control Samples
* Field Duplicates
* Compound Identification /Quantitation

* - All criteria were met for this parameter

System Performance and Overall Assessment

The data as presented requires no qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

No qualifications are required.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8080; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN12

A validation was performed on the Pesticide/Aroclor Data from SDG PEN12. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Contractual Non-Compliance

The method requires that all target compounds, including the multi-component compounds, be analyzed with a five (5) point calibration curve. The laboratory analyzed a single point curve for the Aroclors 1221, 1232, 1242, 1248, and 1254. No positive results were reported for the compounds analyzed with a single point calibration, therefore the data did not require qualification.

Compound Identification/Quantitation

Two (2) samples required dilution to accurately quantitate target compounds. For the following samples, the E flagged results are replaced with the corresponding results from the dilution analysis. All other results from the dilution are not used in favor of the results reported from the original analysis.

041M18B101
041M5A0401

Several samples exhibited column quantitation %Ds greater than 40%. The following guidelines were used to qualify the data:

1. No qualifications are required for positive sample results which exhibited column quantitation differences <40%. The "P" flag is removed from the result.

2. The positive sample result which exhibited a column quantitation difference >40%, but ≤100% is qualified as estimated, J.

3. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and is <10X the respective compound CRQL, is qualified as non-detect, U. (All multi-component results are exempt from this rule.)

4. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and >10X the respective compound CRQL, is qualified as presumptively present at an estimated concentration, NJ. (All multi-component results are exempt from this rule.)

5. The positive multi-component pesticide sample result which exhibited a column quantitation difference >100% and <10X the respective multi-component CRQL is qualified as presumptively present at an estimated concentration, NJ.

Compound Identification/Quantitation, Continued

The following samples and compounds have been qualified for high column quantitation %Ds.

Sample ID	Compound	%D	Lab Qual.	HESI Qual.	Ref. #
041M330201	Gamma-BHC	45.4%	P	J	2
	Dieldrin	2197%	P	U	3
	Methoxychlor	3700%	P	U	3
041M030201	Gamma-BHC	666.0%	P	U	3
	Methoxychlor	1150%	P	U	3
041M030701	Dieldrin	1998%	P	U	3
	Endosulfan Sulfate	52.8%	P	J	2
	Gamma-Chlordane	75.7%	P	J	2
041M5A0401	Gamma-BHC	83.3%	P	J	2
	Dieldrin	762.1%	P	U	3
	Endrin	146.4%	P	U	3
	Endosulfan Sulfate	56.5%	P	J	2
	Methoxychlor	990.9%	P	U	3
	Endrin Aldehyde	364.3%	P	U	3
	Gamma-Chlordane	77.2%	P	J	2
041M5A0501	Endrin	158.3%	P	U	3
041M5A0601	Endosulfan I	120.0%	P	U	3
	Dieldrin	64.3%	P	J	2
	Endrin	36.4%	P		1
	Endosulfan Sulfate	50.0%	P	J	2
	Methoxychlor	1385%	P	U	3
	Alpha-Chlordane	115.4%	P	U	3
	Gamma-Chlordane	828.6%	P	U	3

Compound Identification/Quantitation, Continued

The following samples and compounds have been qualified for high column quantitation %Ds.

Sample ID	Compound	%D	Lab Qual.	HESI Qual.	Ref. #
041M750101	Gamma-BHC	32.0%	P		1
	Dieldrin	1040%	P	U	3
	4,4'-DDT	70.0%	P	J	2
	Methoxychlor	386.5%	P	U	3
	Endrin Aldehyde	793.6%	P	U	3
	Gamma-Chlordane	300.0%	P	U	3
041N750101	Dieldrin	596.4%	P	U	3
	4,4'-DDT	100.0%	P	J	2
	Methoxychlor	633.3%	P	U	3
	Gamma-Chlordane	217.1%	P	U	3
040M2B0201	Gamma-BHC	34.1%	P		1
	Endrin	74.6%	P	J	2
	Endrin Aldehyde	309.1%	p	U	3
041M18B101	4,4'-DDE	49.2%	P	J	2
040M2B0501	Endrin	48.6%	P	J	2
	Endrin Ketone	114.3%	P	U	3
	Endrin Aldehyde	420.8%	P	U	3
040M2B0601	Gamma-BHC	152.9%	P	U	3
	Dieldrin	670.3%	P	U	3
	4,4'-DDT	81.8%	p	J	2

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
041M18B101 041M5A0401	All E flagged	+E	D
041M18B101DL 041M5A0401DL	All except corresponding D flagged results	+/-	Not Used
ALL	All P < 40%	+	
ALL	All P > 40% But ≤ 100%	+	J
ALL	single component pests All P > 100% And < 10X CRQL	+	U
ALL	single component pests All P > 100% And > 10X CRQL	+	NJ
ALL	multi-component pests All P> 100% And < 10X CRQL	+	NJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS, CYANIDE AND TOC

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 6010, 7000, 9012, and 9060; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN12

A validation was performed on the Metals, Cyanide and TOC data from SDG PEN12. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions
*	•	Post Digestion Spiking

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples Affected
Mercury	0.005 mg/Kg	All soil samples ≤ 0.025 mg/Kg
Potassium	3.426 mg/Kg	All soil samples ≤ 17.3 mg/Kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U".

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples Affected
Arsenic	-0.479 mg/Kg	All samples ≤ 4.79 mg/Kg
Cadmium	-0.049 mg/Kg	All samples ≤ 0.49 mg/Kg
Cobalt	-0.165 mg/Kg	All samples ≤ 1.65 mg/Kg
Silver	-0.221 mg/Kg	All samples ≤ 2.21 mg/Kg

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

The equipment rinseate blank 041E082897 exhibited contamination for some target analytes. However, there was no impact on the analytical data because of this contamination.

Matrix Spike Recoveries

The matrix spike recoveries for soils for Antimony (71.3%) and Cyanide (40.6%) were below the lower control limits (>30% but ≤75%). All positive and non-detect results for these analytes are qualified as estimated, "J" or "UJ".

"B" Qualifier

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All soil samples ≤ 0.025 mg/Kg	Hg	+	U
All soil samples ≤ 17.3 mg/Kg	K	+	U
All soil samples ≤ 4.79 mg/Kg	As	+/-	J/UJ
All soil samples ≤ 0.49 mg/Kg	Cd	+/-	J/UJ
All samples ≤ 1.65 mg/Kg	Co	+/-	J/UJ
All samples ≤ 2.21 mg/Kg	Ag	+/-	J/UJ
All soil samples	Sb, CN	+/-	J/UJ
All soil samples	All	+ "B"	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PEN13
Date:	October 14, 1997
Client Name:	EnSafe
Project/Site Name:	Pensacola - Sites 40 & 41
Date Sampled:	September 3-8, 1997
Number of Samples:	11 Non-aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticide/PCB's, Metals, Cyanide, Total Organic Carbons

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

for Kimberly S. Hopp — 14 October 1997

Paul B. Humburg, President — Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# PEN13

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	VOA		SVOA		P/P		TAL		CN		TOC	
040M2B0701	SOIL				X		X		X				X
040M2B0801	SOIL		X		X		X		X				X
040M2B0901	SOIL				X		X		X		X		X
040M2B1001	SOIL				X		X		X				X
040SR10910	SOIL								X				
040SR20920	SOIL								X				
040SR30930	SOIL								X				
041M160301	SOIL		X		X		X		X				X
041M640401	SOIL		X		X		X		X				X
041M640501	SOIL		X		X		X		X				X
041M640601	SOIL				X		X		X				X
Total Billable Samples	(Water/Soil)	0	4	0	8	0	8	0	11	0	1	0	8

VOA = Volatiles
SV = Semivolatiles
P/P = Pesticide/PCB's
TAL = Metals
CN = Cyanide
TOC = Total Organic Carbons

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846, Method 8240; the National Functional Guidelines for Organic Data Review, February 1994, and DQO Level III. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG # PEN13

A validation was performed on the Volatile Data from SDG PEN13. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
	•	Calibrations
*	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicate
*	•	Field Duplicates
	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

The continuing calibration, MQ349, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

041M640401	acetone (25.8)
041M640501RE	

Compound Identification/Quantitation

Specific Finding:

Do not use results for the sample 041M640501, in favor of the re-analyzed sample results due to non compliant internal standard areas.

System Performance and Overall Assessment

The laboratory did not encounter any large problems. The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

D= result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
041M640401 041M640501RE	acetone (25.8)	+	J
041M640501	All results	+/-	Do not use

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846 8270; the National Functional Guidelines for Organic Data Review, February 1994, and DQO Level III. All comments made within this report should be considered when examining the analytical results.

SDG # PEN13

A validation was performed on the Semivolatile Data from SDG PEN13. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
  Calibrations
  Internal Standard Performance
* Blanks
* Surrogate Recoveries
* Laboratory Control Samples
* Field Duplicates
  Compound Identification /Quantitation

* - All criteria were met for this parameter

Continuing Calibrations

The continuing calibrations were acceptable for all average RRFs. All %Ds were not within continuing calibration criteria. Qualifications are required.

Continuing Calibration (continued)

The continuing calibration, GQ569, contained compounds with %Ds greater than 25% but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040M2B0801	pyrene (25.8%)
041M640401	
041M640501	
041M640601	

The continuing calibration, GQ569, contained compounds with %Ds greater than 25% but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

041M640401	carbazole (27.8%)
041M640501	
041M640601	

The continuing calibration, JQ766, contained compounds with %Ds greater than 25% but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

040M2B0701	pyrene (40.2%)

The continuing calibration, JQ766, contained compounds with %Ds greater than 50% but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detects as estimated (UJ).

040M2B0701	2,2'-oxybis(1-chloropropene) (68.8%)
040M2B1001	3,3'-dichlorobenzidine (65.3%)
041M160301	

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria. Qualifications are required.

Internal Standards (continued)

The following samples exhibited low internal standard area for the internal standard listed. Qualify associated positive results as estimated (J) and non detects as estimated (UJ).

041M640501	perylene-d_{12}
041M640401	

Compound Identification/Quantitation

Do not use samples 041M640501RE and 041M640401RE, in favor of the initial analysis, due to non compliant internal standard area recoveries.

System Performance and Overall Assessment

The data as presented requires qualifications.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
040M2B0801 041M640401 041M640501 041M640601	pyrene	+	J
041M640401 041M640501 041M640601	carbazole	+	J
040M2B0701	pyrene	+	J
040M2B0701 040M2B1001 041M160301	bis(2-chloroisopropyl)ether 3,3'-dichlorobenzidine	+/-	J/UJ
041M640501 041M640401	All associated compounds perylene-d_{12}	+/-	J/UJ
041M640501RE 041M640401RE	all compounds	+/-	do not use

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
040M2B0801 041M640401 041M640501 041M640601	pyrene	+	J
041M640401 041M640501 041M640601	carbazole	+	J
040M2B0701	pyrene	+	J
040M2B0701 040M2B1001 041M160301	bis(2-chloroisopropyl)ether 3,3'-dichlorobenzidine	+/-	J/UJ
041M640501 041M640401	All associated compounds perylene-d_{12}	+/-	J/UJ
041M640501RE 041M640401RE	all compounds	+/-	do not use

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8080; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN13

A validation was performed on the Pesticide/Aroclor Data from SDG PEN13. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Contractual Non-Compliance

The method requires that all target compounds, including the multi-component compounds, be analyzed with a five (5) point calibration curve. The laboratory analyzed a single point curve for the Aroclors 1221, 1232, 1242, 1248, and 1254. No positive results were reported for the compounds analyzed with a single point calibration, therefore the data did not require qualification.

Compound Identification/Quantitation

Several target compounds were not confirmed due to coelution of matrix interferences and flagged X by the laboratory. The sample concentrations were too low for GC/MS confirmation. It is the profession opinion of the data reviewer that these results be considered presumptively present at an estimated concentration. For the following samples and compounds, the positive results which did not meet the confirmation criteria should be considered presumptively present and are qualified as estimated, NJ.

041M640401	Delta-BHC
041M640601	

Several samples exhibited column quantitation %Ds greater than 40%. The following guidelines were used to qualify the data:

1. No qualifications are required for positive sample results which exhibited column quantitation differences <40%. The "P" flag is removed from the result.

2. The positive sample result which exhibited a column quantitation difference >40%, but ≤100% is qualified as estimated, J.

3. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and is <10X the respective compound CRQL, is qualified as non-detect, U. (All multi-component results are exempt from this rule.)

4. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and >10X the respective compound CRQL, is qualified as presumptively present at an estimated concentration, NJ. (All multi-component results are exempt from this rule.)

5. The positive multi-component pesticide sample result which exhibited a column quantitation difference >100% and <10X the respective multi-component CRQL is qualified as presumptively present at an estimated concentration, NJ.

Compound Identification/Quantitation, Continued

The following samples and compounds have been qualified for high column quantitation %Ds.

Sample ID	Compound	%D	Lab Qual.	HESI Qual.	Ref. #
041M640601	Gamma-BHC	1689.5%	P	U	3
	Aldrin	605.9%	P	U	3
	Heptachlor Epoxide	50920%	P	U	3
	Endosulfan I	76.9%	P	J	2
	Dieldrin	27.3%	P		1
	4,4'-DDT	31.6%	P		1
	Alpha-Chlordane	116.7%	P	U	3
	Gamma-Chlordane	144.4%	P	U	3
040M2B0701	4,4'-DDE	139.1%	P	U	3
041M640501	Aldrin	2207.7%	P	U	3
	Heptachlor Epoxide	499.0%	P	U	3
	Endosulfan I	237.2%	P	U	3
	4,4'-DDT	120.8%	P	U	3
	Gamma-Chlordane	185.7%	P	U	3
041M640401	Aldrin	1207.7%	P	U	3
	Endosulfan I	50.0%	P	J	2
	4,4'-DDT	72.2%	P	J	2
	Alpha-Chlordane	94.6%	P	J	2
	Gamma-Chlordane	1275.0%	P	U	3
	Aroclor-1260	26.7%	P		1
040M2B0801	Dieldrin	38.5%	P		1

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
041M640401 041M640601	Delta-BHC	+	NJ
ALL	All P < 40%	+	
ALL	All P > 40% But ≤ 100%	+	J
ALL	single component pests All P > 100% And < 10X CRQL	+	U
ALL	single component pests All P > 100% And > 10X CRQL	+	NJ
ALL	multi-component pests All P> 100% And < 10X CRQL	+	NJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS, CYANIDE AND TOC

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 6010, 7000, 9012, and 9060; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN13

A validation was performed on the Metals, Cyanide and TOC data from SDG PEN13. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
*	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
	•	Serial Dilutions
*	•	Post Digestion Spiking

* - All criteria were met for this parameter.

Preparation and Field Blanks

The preparation blank exhibited contamination for the following elements.

Elements	Conc.	Samples Affected
Mercury	0.002 mg/Kg	All soil samples ≤ 0.010 mg/Kg
Sodium	6.636 mg/Kg	No Impact
Zinc	0.518 mg/Kg	All soil samples ≤ 2.59 mg/Kg

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U".

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples Affected
Silver	-0.180 mg/Kg	All samples ≤ 1.80 mg/Kg
Thallium	-0.472 mg/Kg	All samples ≤ 4.72 mg/Kg

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

The equipment rinseate blank 041E082897 exhibited contamination for some target analytes. However there was no impact on the analytical data because of this contamination.

Serial Dilution Results

The serial dilution for Aluminum was outside the control limits of 10% (42.1%). All positive results are qualified as estimated, "J".

"B" Qualifier

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All soil samples ≤ 0.010mg/kg	Hg	+	U
All soil samples ≤ 2.59mg/kg	Zn	+	U
All soil samples ≤ 1.80mg/kg	Ag	+/-	J/UJ
All soil samples ≤ 4.72mg/kg	Tl	+/-	J/UJ
All soil samples	Al	+	J
All soil samples	All	+ "B"	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PEN14
Date:	October 8, 1997
Client Name:	EnSafe
Project/Site Name:	Pensacola, Sites 40 & 41
Date Sampled:	September 4, 1997
Number of Samples:	5 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Volatiles, Semivolatiles, Pesticide/PCB's, Metals, Cyanide

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Searles
for Paul B. Humburg, President

10/10/97
Date

4127 Plaza 94 South · St. Charles, MO 63304
(314) 936-1332 · Fax (314) 936-1335

SDG# PEN14

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	VOA		SVOA		P/P		TAL/CN	
040W2B0101	WATER	X		X		X		X	
040TW09047	WATER	X							
041W640101	WATER	X		X		X		X	
041W640501	WATER	X		X		X		X	
041R640501	WATER	X		X		X		X	
Total Billable Samples	(Water/Soil)	5	0	4	0	4	0	4	0

VOA = Volatiles
SV = Semivolatiles
P/P = Pesticide/PCB's
TAL/CN = Metals w/Cyanide

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8240; the National Functional Guidelines for Organic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN14

A validation was performed on the Volatile Data from SDG PEN14. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Internal Standard Performance
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Field QC Blanks

The trip and rinseate blanks associated with these samples exhibited contamination. The samples required qualification. The end-user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into consideration when applying the 5X or 10X criteria to field samples.

Field QC Blanks, continued

Associated Blanks	Compound	Conc.	Action Level
040TW09047	carbon disulfide	0.46 μg/L	4.6 μg/L
041E082897	carbon disulfide	0.90 μg/L	9.0 μg/L

Samples	Compound	Qualification
040W2B0101	carbon disulfide	CRQL
041W640101		
041W640501		
041R640501		

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X (10X for common laboratory contaminants) the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
040W2B0101	carbon disulfide	+	CRQL
041W640101			
041W640501			
041R640501			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries. GC/MS performance, tuning results. calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846 8270; the National Functional Guidelines for Organic Data Review, February 1994; and DQO Level III. All comments made within this report should be considered when examining the analytical results.

SDG # PEN14

A validation was performed on the Semivolatile Data from SDG PEN14. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
* Calibrations
* Internal Standard Performance
* Blanks
* Surrogate Recoveries
* Laboratory Control Samples
* Field Duplicates
* Compound Identification /Quantitation

* - All criteria were met for this parameter

System Performance and Overall Assessment

The data as presented requires no qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

No qualifications are required.

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8080; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN14

A validation was performed on the Pesticide/Aroclor Data from SDG PEN14. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Contractual Non-Compliance

The method requires that all target compounds, including the multi-component compounds, be analyzed with a five (5) point calibration curve. The laboratory analyzed a single point curve for the Aroclors 1221, 1232, 1242, 1248, and 1254. No positive results were reported for the compounds analyzed with a single point calibration, therefore the data did not require qualification.

Compound Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 40%. The following guidelines were used to qualify the data:

1. No qualifications are required for positive sample results which exhibited column quantitation differences <40%. The "P" flag is removed from the result.

2. The positive sample result which exhibited a column quantitation difference >40%, but ≤100% is qualified as estimated, J.

3. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and is <10X the respective compound CRQL, is qualified as non-detect, U. (All multi-component results are exempt from this rule.)

4. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and >10X the respective compound CRQL, is qualified as presumptively present at an estimated concentration, NJ. (All multi-component results are exempt from this rule.)

5. The positive multi-component pesticide sample result which exhibited a column quantitation difference >100% and <10X the respective multi-component CRQL is qualified as presumptively present at an estimated concentration, NJ.

The following samples and compounds have been qualified for high column quantitation %Ds.

Sample ID	Compound	%D	Lab Qual.	HESI Qual.	Ref. #
041W640501	Beta-BHC	303.2%	P	U	3
	Gamma-BHC	207.7%	P	U	3
041W640101	Beta-BHC	52.8%	P	J	2
	Gamma-BHC	220.0%	P	U	3
041R640501	Beta-BHC	82.4%	P	J	2
	Gamma-BHC	328.6%	P	U	3
040W2B0101	Beta-BHC	157.1%	P	U	3
	Gamma-BHC	441.7%	P	U	3

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
ALL	All P < 40%	+	
ALL	All P > 40% But ≤ 100%	+	J
ALL	single component pests All P > 100% And < 10X CRQL	+	U
ALL	single component pests All P > 100% And > 10X CRQL	+	NJ
ALL	multi-component pests All P> 100% And < 10X CRQL	+	NJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
METALS AND CYANIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the CLP ILM03.0 Method; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN14

A validation was performed on the Metals and Cyanide Data from SDG PEN14. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
	•	Serial Dilutions
	•	Post Digestion Spiking

* - All criteria were met for this parameter.

Preparation and Field Blanks

The calibration blanks exhibited contamination for the following elements.

Elements	Conc.	Samples affected
Aluminum	30.0 ug/l	all water samples below 150 ug/l
Barium	0.9 ug/l	no impact
Calcium	30.4 ug/l	no impact
Magnesium	25.3 ug/l	no impact
Manganese	0.8 ug/l	no impact
Vanadium	0.8 ug/l	all water samples below 4.0 ug/l

The USEPA requires that all sample values below five times the preparation, field, DI or calibration blank contamination be qualified as non-detect, "U".

The preparation blank exhibited negative bias for the following elements.

Elements	Conc.	Samples affected
Cadmium	-0.75 ug/l	all water samples below 7.5 ug/l
Chromium	-1.06 ug/l	all water samples below 10.6 ug/l
Nickel	-1.75 ug/l	all water samples below 17.5 ug/l

This reviewer qualifies all samples results below ten times the negative bias as estimated, "J" or "UJ".

Matrix Spike Recovery

The Matrix Spike recoveries for waters for Mercury (68%) and Silver (61%) were below the lower control limits (>30% but <75%). All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recovery for waters for Zinc (128%) was above the upper control limits (>125%). All positive results are qualified as estimated, "J".

Serial Dilution results

The serial dilution for waters for Potassium was outside the control limits of 10%. All positive results are qualified as estimated, "J".

Post Digestion Spiking results

The post digestion spiking for the following samples were below the lower control limits (>10% but <85%). All positive and non-detect results are qualified as estimated "J" or "UJ".

Analytes	Sample IDs	Recovery
Silver	040W2B0101	53
Silver	041W640101	62
Silver	041W640501	60
Silver	041R640501	64
Thallium	040W2B0101	63
Thallium	041W640101	81
Thallium	041W640501	67
Thallium	041R640501	68

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All water samples below 150 ug/l	Al.	+	U
All water samples below 4.0 ug/l	V.		
All water samples below 7.5 ug/l	Cd.	+/U	J/UJ
All water samples below 10.6 ug/l	Cr.		
All water samples below 17.5 ug/l	Ni.		
All water samples	Hg and Ag.	+/U	J/UJ
All water samples	Zn.	+	J
All water samples	K.	+	J
041W640101, 041W640501, 041R640501 and 040W2B0101.	Ag and Tl.	+/U	J/UJ
All "B" results	all analytes	B	J

"B" qualifier

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PEN15
Date:	October 30, 1997
Client Name:	EnSafe
Project/Site Name:	Pensacola
Date Sampled:	September 2-8, 1997
Number of Samples:	8 Non-aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Savannah Laboratories
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data, June 1991 and February, 1994, respectively
QA/QC Level:	EPA DQO Level III
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Polynuclear Aromatic Hydrocarbons, Pesticide/PCB's, Lead

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Searfoss
for Paul B. Humburg, President

11/4/97
Date

4127 Plaza 94 South · St. Charles, MO 63304
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SDG# PEN15

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

ENSAFE ID	MATRIX	PAH		P/P		PB	
040J400601	SOIL		X		X		X
040J400602	SOIL				X		X
041J18B101	SOIL		X		X		X
041J330101	SOIL				X		X
041J330201	SOIL		X		X		X
041J640101	SOIL		X		X		X
041J640601	SOIL		X		X		X
041J750101	SOIL		X		X		X
Total Billable Samples	(Water/Soil)	0	6	0	8	0	8

PAH = Polynuclear Aromatic Hydrocarbons
P/P = Pesticide/PCB's
PB = Lead

DATA ASSESSMENT NARRATIVES

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA SW846, method 8270; National Functional Guidelines for Organic Data Review, February 1994 and DQO Level III All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # PEN15

A validation was performed on the Semivolatile Data from SDG PEN15. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC/MS Tuning
*	•	Calibrations
	•	Internal Standard Performance
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Laboratory Control Sample
*	•	Field Duplicates
*	•	Compound Identification /Quantitation

* - All criteria were met for this parameter

Internal Standards

The samples listed below, exhibited low internal standard areas. Qualify all associated positive results as estimated (J) and all non detects as estimated (UJ).

041J750101	chrysene-d_{12} perylene-d_{12}
041J188101	perylene-d_{12}
041J330201	
041J640101	

System Performance and Overall Assessment

The laboratory did not encounter any large problems. The data requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL
	All associated compounds	+/-	J/UJ
041J750101	chrysene-d_{12} perylene-d_{12}		
041J188101 041J330201 041J640101	perylene-d_{12}		

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLORS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 Method 8080; the National Functional Guidelines for Organic Data Validation, February 1994; and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN15

A validation was performed on the Pesticide/Aroclor Data from SDG PEN15. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
*	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Contractual Non-Compliance

The method requires that all target compounds, including the multi-component compounds, be analyzed with a five (5) point calibration curve. The laboratory analyzed a single point curve for the Aroclors 1221, 1232, 1242, 1248, and 1254. No positive results were reported for the compounds analyzed with a single point calibration, therefore the data did not require qualification.

Method Blanks

The associated method blank exhibited contamination for target compounds and required qualifications. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moistures as associated samples. These factors must be taken into consideration when applying the 5X criteria to field samples. The method blank results were compared to the associated samples.

Blank ID	Compound	Concentration	Action Level
0923Q-KMB	Delta-BHC	0.20 J µg/Kg	1.0 µg/Kg
	4,4'-DDD	0.28 JP µg/Kg	1.4 µg/Kg

The following samples have been qualified for method blank contamination. The qualifications are for all the blanks.

Sample	Compound	Qualification
040J400602	Delta-BHC	CRQL
041J330201	4,4'-DDD	CRQL

Compound Identification/Quantitation

Several samples exhibited column quantitation %Ds greater than 40%. The following guidelines were used to qualify the data:

1. No qualifications are required for positive sample results which exhibited column quantitation differences <40%. The "P" flag is removed from the result.

2. The positive sample result which exhibited a column quantitation difference >40%, but ≤100% is qualified as estimated, J.

3. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and is <10X the respective compound CRQL, is qualified as non-detect, U. (All multi-component results are exempt from this rule.)

Compound Identification/Quantitation, Continued

4. The positive single component pesticide sample result which exhibited a column quantitation difference >100% and >10X the respective compound CRQL, is qualified as presumptively present at an estimated concentration, NJ. (All multi-component results are exempt from this rule.)

5. The positive multi-component pesticide sample result which exhibited a column quantitation difference >100% and <10X the respective multi-component CRQL is qualified as presumptively present at an estimated concentration, NJ.

The following samples and compounds have been qualified for high column quantitation %Ds.

Sample ID	Compound	%D	Lab Qual.	HESI Qual.	Ref. #
040J400601	Gamma-BHC	26.4%	P		1
	Alpha-chlordane	1081.8%	P	U	3
	Gamma-Chlordane	41.2%	P	J	2
040J400602	Delta-BHC	88.2%	P	J	2
	Gamma-BHC	35.1%	P		1
	Aldrin	106.4%	P	U	3
	Heptachlor Epoxide	135.3%	P	U	3
	Dieldrin	46.2%	P	J	2
	Alpha-Chlordane	533.8%	P	U	3
	Gamma-Chlordane	82.4%	P	J	2
041J18B101	4,4'-DDT	159.7	P	U	3
	Alpha-Chlordane	85.7%	P	J	2
041J640101	Gamma-BHC	50.0%	P	J	2
	Endosulfan I	100.0%	P	J	2
	Dieldrin	30.3%	P		1
	4,4'-DDT	89.3%	P	J	2
	Alpha-Chlordane	143.6%	P	U	3
	Gamma-Chlordane	109.0%	P	U	3
	Aroclor-1260	92.3%	P	J	2

Compound Identification/Quantitation, Continued

Sample ID	Compound	%D	Lab Qual.	HESI Qual.	Ref. #
041J640601	Endosulfan I	58.3%	P	J	2
	Dieldrin	262.5%	P	U	3
	Alpha-Chlordane	58.3%	P	J	2
	Gamma-Chlordane	73.7%	P	J	2
	Aroclor-1260	46.3%	P	J	2
041J330201	Dieldrin	361.5%	P	U	3
	4,4'-DDE	86.7%	P	J	2
	4,4'-DDD	414.3%	P	U	3
	4,4'-DDT	42.8%	P	J	2
	Gamma-Chlordane	486.2%	P	U	3
041J330101	Heptachlor	37.5%	P		1
	Aldrin	423.8%	P	U	3
	Endosulfan I	233.3%	P	U	3
	Dieldrin	445.4%	P	U	3
	4,4'-DDE	27.8%	P		1
	Endrin Aldehyde	214.3%	P	U	3
	Alpha-Chlordane	227.3%	P	U	3
	Gamma-Chlordane	81.8%	P	J	2
041J750101	4,4'-DDT	237.0%	P	U	3

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
040J400602	Delta-BHC	+	CRQL
041J330201	4,4'-DDD	+	CRQL
ALL	All P < 40%	+	
ALL	All P > 40% But ≤ 100%	+	J
ALL	single component pests All P > 100% And < 10X CRQL	+	U
ALL	single component pests All P > 100% And > 10X CRQL	+	NJ
ALL	multi-component pests All P> 100% And < 10X CRQL	+	NJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non-detect result

DATA ASSESSMENT NARRATIVE
LEAD ONLY

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW 846 Methods; the Functional Guidelines for Inorganic Data Validation, February 1994, and DQO Level III requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PEN15

A validation was performed on the Lead only Data from SDG PEN15. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	Calibrations
*	•	Blanks
*	•	Interferences
*	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
*	•	Serial Dilutions

* - All criteria were met for this parameter.

Specific Finding

All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B" per Ensafe's request.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All "B" results	all analytes	B	J