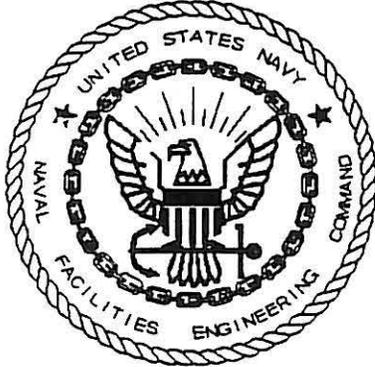


N61165.AR.003176  
CNC CHARLESTON  
5090.3a

DRAFT ZONE E RESOURCE CONSERVATION AND RECOVERY FACILITY INVESTIGATION  
REPORT VOLUME XIII OF XV APPENDIX I PART 2 CNC CHARLESTON SC  
11/1/1997  
ENSAFE

**DRAFT ZONE E  
RCRA FACILITY INVESTIGATION REPORT  
NAVBASE CHARLESTON**

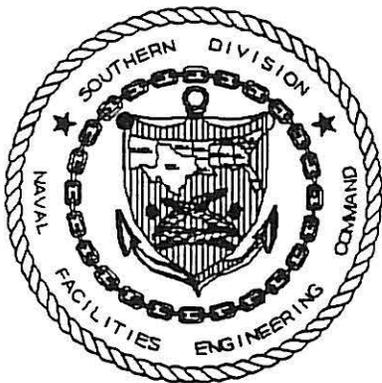


**VOLUME XIII OF XV  
APPENDIX I (Part 2)**

**CTO-029  
CONTRACT NO: N62467-89-D-0318**

**Prepared for:**

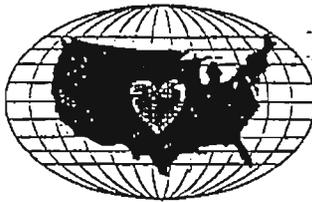
**Department of the Navy  
Southern Division  
Naval Facilities Engineering Command  
North Charleston, South Carolina**



**Prepared by:**

**EnSafe Inc.  
5724 Summer Trees Drive  
Memphis, Tennessee 38134  
(901) 372-7962**

**November 1997**



# HEARTLAND

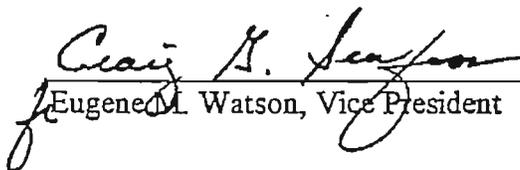
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24170A  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: November 29 - 30, 1995  
Number of Samples: 25 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: 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:

  
Eugene M. Watson, Vice President

3-14-96  
Date

SDG# 24170A

### Samples and Fractions Reviewed

Sample Identifications      Analytical Fractions

ENSAFE ID	MATRIX	TAL	CN
054SB03601	SOIL	X	
054SB03701	SOIL	X	
054SB03801	SOIL	X	
054SB03901	SOIL	X	
054SB04001	SOIL	X	
054SB03301	SOIL	X	
054SB03302	SOIL	X	
054SB03401	SOIL	X	
054SB03501	SOIL	X	
054SB03502	SOIL	X	
054SB04002	SOIL	X	
083SB00101	SOIL	X	X
083SB00102	SOIL	X	X
084SB00101	SOIL	X	X
084SB00102	SOIL	X	X
574SB00101	SOIL	X	X
574SB00102	SOIL	X	X
574SB00201	SOIL	X	X
574SB00202	SOIL	X	X
574SB00301	SOIL	X	X
574SB00302	SOIL	X	X
574SB00401	SOIL	X	X
574SB00402	SOIL	X	X
574SB00501	SOIL	X	X
574SB00502	SOIL	X	X
Total Billable Samples (Water/Soil)		0 25	0 14

TAL = SW846 Metals

CN = SW846 Cyanide

# 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 # 24170

A validation was performed on the Metals Data from SDG 24170. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.16 mg/kg	no impact
Iron	2.07 mg/kg	no impact
Lead	0.41 mg/kg	no impact
Potassium	109 mg/kg	all soil samples below 545 mg/kg
Sodium	16.4 mg/kg	all soil samples below 82.0 mg/kg

Tin	3.44 mg/kg	all soil samples below 17.2 mg/kg
Nickel	0.43 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 Mercury (16%) was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

The Matrix Spike recoveries for Antimony (67%) and Tin (71%) were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recovery for Lead (206%) was above the upper control limits. All positive results are qualified as estimated, "J".

## Duplicate Analysis

### Specific Finding

The Field Duplicate analyses for Calcium, Manganese, Nickel and Tin were outside the control limits of 50%. All positive results are qualified as estimated, "J" >

### 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 Ensafé's request.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 545 mg/kg	K.	+	U
all soil samples below 82.0 mg/kg	Na.		
all soil samples below 17.2 mg/kg	Sn.		
all soil samples	Hg.	+	J
		U	R
all soil samples	Sb and Sn.	+/U	J/UJ
all soil samples	Pb.	+	J
all soil samples	Ca, Na, Mn and Sn.	+	J
All "B" results	all analytes	B	J

**DATA ASSESSMENT NARRATIVE**  
**CHLORINATED PESTICIDES/PCBs**

**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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24170**

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24170. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

**Calibration**

Two samples contain percent differences greater than 15% for the calibration verification. Qualify positive results for specific compounds as estimated.

<u>Sample ID</u>	<u>Analyte</u>	<u>%D</u>
574SB00502	4,4'-DDT	23.8
574SB00102	4,4'-DDT	-32.4, -34.8

**Surrogate Recoveries**

Four samples exhibit surrogate recoveries greater than the upper limit. Qualify all positive results as estimated (J). Two samples exhibit surrogate recoveries Greater than 10% and less

than the lower limit. Qualify all positive results as estimated (J) and all non-detect results as estimated (UJ).

<u>Sample ID</u>	<u>Surrogate</u>	<u>%Rec</u>
574SB00201	DCB-1	151
574SB00301	DCB-1	288
574SB00401	TCX-1	18
574SB00401	DCB-1	229
574SB00402	TCX-1	17
574SB00502	DCB-1	204
083SB00102	DCB-1	318

### **System Performance and Overall Assessment**

Overall performance was acceptable. The data did require qualifications/rejections as stated above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
083SB00102	Methoxychlor	+	J
574SB00102	4,4'-DDD	+	J
574SB00201	4,4'-DDE	+	J
574SB00301	4,4'-DDE	+	J
574SB00401	ALL	-	UJ
574SB00402	ALL	-	UJ
574SB00502	Endosulfan Sulfate	+	J
574SB00502	4,4'-DDT	+	J
574SB00502	Methoxychlor	+	J
574SB00502	Endrin Ketone	+	J
574SB00502	Endrin Aldehyde	+	J

<u>SAMPLE ID</u>	<u>SURROGATE</u>	<u>%REC</u>
574SB00201	DCB-1	151
574SB00301	DCB-1	288
574SB00401	TCX-1	18
574SB00401	DCB-1	229
574SB00402	TCX-1	17
574SB00502	DCB-1	204
083SB00102	DCB-1	318

- \* 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

## ORGANOPHOSPHORUS PESTICIDES

### 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 8140; 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 # 24170A

A validation was performed on the Organophosphorus Pesticide Data from SDG 24170A. 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.

### 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

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

### CHLORINATED HERBICIDES

#### 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 8150; 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 # 24170A

A validation was performed on the Herbicide Data from SDG 24170A. 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.

#### 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.



# HEARTLAND

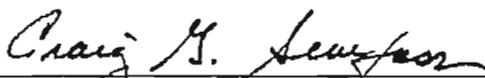
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24170  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: November 29 - 30, 1995  
Number of Samples: 8 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: Gasoline Range Organics, Diesel Range Organics

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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

4-12-96  
\_\_\_\_\_  
Date

SDG# 24170

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	GRO	DRO		
574SB00101	SOIL	X	X		
574SB00102	SOIL	X	X		
574SB00201	SOIL	X	X		
574SB00202	SOIL	X	X		
574SB00301	SOIL	X	X		
574SB00302	SOIL	X	X		
574SB00401	SOIL	X	X		
574SB00402	SOIL	X	X		
Total Billable Samples (Water/Soil)		0	8	0	8

GRO= SW846 Gasoline Range Organics

DRO= SW846 Diesel Range Organics

## DATA ASSESSMENT NARRATIVE

### TPH - EXTRACTABLES AND PURGEABLES

#### 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, calibration results, surrogate and matrix spike recoveries, and GC performance. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8015, modified for extractable and purgeable TPH; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24170 (24190)

A validation was performed on the TPH by GC data from SDG 24170. 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
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

**DATA ASSESSMENT NARRATIVE  
TPH - EXTRACTABLES AND PURGEABLES**

**PAGE 2**

**Surrogate Recoveries**

Several samples required qualification due to non-compliant surrogate recoveries for the purgeables fraction (gasoline).

**Specific Findings**

The following samples exhibited surrogate recoveries above the QC limits. All positive results are qualified as estimated, J.

<u>Sample</u>	<u>Surrogate</u>	<u>% Recovery</u>
574SB00302	Naphthalene	292 %
574SB00102		150 %

The following samples exhibited surrogate recoveries below the QC limits. All positive results are qualified as estimated, J, and all non-detect results are qualified as estimated, UJ.

<u>Sample</u>	<u>Surrogate</u>	<u>% Recovery</u>
574SB00101	Naphthalene	23 %
574SB00201		31 %
574SB00202		55 %
574SB00301		38 %

**Overall Performance**

Overall performance was acceptable. The reviewer estimates that less than 5% of the data required qualification.

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
574SB00302 574SB00102	gasoline	+	J
574SB00101 574SB00201 574SB00202 574SB00301	gasoline	+/-	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

## DIOXIN/FURANS - 8290

### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24170

A validation was performed on the Dioxin/Furan Data from SDG 24170. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- \* • Blanks
- \* • Laboratory Control Samples
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

### Blanks

Congener ID	MB Conc. (pg/L)	054CB03301	Q	054CB03701	Q
1,2,3,4,6,7,8-HpCDF	0.343	16.8	NA	43	NA

## 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
All samples	1,2,3,4,6,7,8-HpCDF	+B	NA

- \* 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

### SEMIVOLATILES - ORGANOTINS

#### 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, calibration results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8270, modified for organotins; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24170S

A validation was performed on the organotin data from SDGs 24170S. 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
- Identification/Quantitation

\* - All criteria were met for this parameter.

#### Continuing Calibration

#### Specific Finding

The continuing calibration standard FFF684.D exhibited a %D for one (1) compound that was above 50% but less than 90%. All positive and non-detect results in associated samples are qualified as estimated, J/UJ.

574SB00101	574SB00202	054SB03502	tributyltin (58.3%)
574SB00201	574SB00301		

**DATA ASSESSMENT NARRATIVE  
SEMIVOLATILES - ORGANOTINS**

**PAGE 2**

**Matrix Spike/Matrix Spike Duplicates**

The MS/MSD pair and two (2) of the LCS/LCSD pairs extracted with two (2) of the three (3) analytical batches in this SDG exhibited recoveries for tributyltin between 0% and 7%. The laboratory noted in the case narrative that problems have developed with the recovery of this compound. Therefore, based on the lack of data supporting that the compound can be recovered in the DI water or the sample matrix for those two (2) extraction batches, non-detect results required rejection in the samples.

**Specific Finding**

Reported positive results required qualification as estimated, J, and non-detect results required rejection, R, due to 0% recoveries in the MS/MSD pair and LCS/LCSD pair for the compound tributyltin in the following samples.

<u>Samples</u>	<u>Compound</u>	<u>MS/MSD</u>	<u>LCS/LCSD1</u>	<u>LCS/LCSD3</u>
574SB00101	tributyltin	6%/7%	0%/0%	NA
574SB00201				
574SB00202				
574SB00301				
054SB03502				
574SB00302				
574SB00501				
574SB00502				
083SB00101				
574SB00102				
574SB00401				
574SB00402				
054SB03301				
054SB03302				
054SB03501				
054SB03502RE				
054SB03601				
054SB03401				
083SB00102				
054SB03701	tributyltin	NA	NA	0%/0%
054SB04001				
054SB04002				
054SB03901				

**DATA ASSESSMENT NARRATIVE  
SEMIVOLATILES - ORGANOTINS**

**PAGE 3**

**Identification/Quantitation**

**Specific Finding**

The following RE sample is rejected in favor of the results reported from the original analysis.

054SB03502RE

**Overall Performance**

Overall performance was not acceptable.

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>			
574SB00101	tributyltin	+/-	J/UJ			
574SB00202						
054SB03502						
574SB00201						
574SB00301						
574SB00101	tributyltin	+/-	J/R			
574SB00201						
574SB00202						
574SB00301						
054SB03502						
574SB00302						
574SB00501						
574SB00502						
083SB00101						
574SB00102						
574SB00401						
574SB00402						
054SB03301						
054SB03302						
054SB03501						
054SB03502RE						
054SB03601						
054SB03401						
083SB00102						
054SB03701						
054SB04001						
054SB04002						
054SB03901						
054SB03502RE				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



# HEARTLAND

ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24170F  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: November 29 - 30, 1995  
Number of Samples: 2 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Organotins

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:

*Kimberly S. Groop*  
for Eugene M. Watson, Vice President

*20 March 1996*  
Date

SDG# 24170F

### Samples and Fractions Reviewed

Sample Identifications Analytical Fractions

ENSAFE ID	MATRIX	ORG
054CB03701	SOIL	X
054CB03301	SOIL	X
Total Billable Samples (Water/Soil)		0 2

ORG= SW846 Organotins

## DATA ASSESSMENT NARRATIVE

### SEMIVOLATILES - ORGANOTINS

#### 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, calibration results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8270, modified for organotins; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24170F

A validation was performed on the organotin data from SDGs 24170F. 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
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

#### Overall Performance

Overall performance was acceptable.

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
------------------	--------------------	-----------	-----------

NO QUALIFICATIONS WERE 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



# HEARTLAND

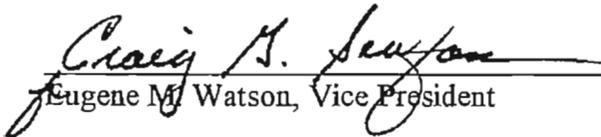
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24170A  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: November 29 - 30, 1995  
Number of Samples: 2 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Semivolatiles, Organophosphorus Pesticides, Herbicides, Dioxin, Hexavalent Chromium

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:

  
Eugene M. Watson, Vice President

3-13-96  
Date

SDG# 24170A

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	SV	OPP	HERB	DIO	HCR	
054CB03301	SOIL	X	X	X	X	X	
054CB03701	SOIL	X	X	X	X	X	
Total Billable Samples (Water/Soil)		0	2	0	2	0	2

SV = SW846 Semivolatiles  
OPP = SW846 Organophosphorus Pesticides  
HERB = SW846 Herbicides  
DIO = SW846 Dioxin  
HCR = SW846 Hexavalent Chromium

## 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, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24170A

A validation was performed on the Semivolatile Data from SDG 24170A. 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.

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, A0511,-513, 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 detect as estimated (UJ).

054CB03301                      2,3,4,6-tetrachlorophenol (51.7)  
054CB03701

The continuing calibration, A0532,-533,- 534.-535,-536,-537, 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 detect as estimated (UJ).

054CB03301                      3,3'-dimethylbenzidine (66.6)  
054CB03701                      1,3,5-trinitrobenzene (68.4)  
   diallate (67.1)  
   kepone (79.7)

The continuing calibration, A0532,-533,- 534.-535,-536,-537, 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 detect (R).

054CB03301                      4-nitroquinoline-1-oxide (236.5)  
054CB03701                      hexachlorophene (164.3)

The continuing calibration, A0532,-533,- 534.-535,-536,-537, 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).

054CB03301                      aramite  
054CB03701                      methapyriline (77.5)

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

**Method Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action level</u>
SBLK1	bis(2-ethylhexyl)phthalate	1200	12000
<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>	
054CB03301	bis(2-ethylhexyl)phthalate	CRQL	
054CB03701	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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
054CB03301 054CB03701	2,3,4,6-tetrachlorophenol (51.7)	+/-	J/UJ
054CB03301 054CB03701	3,3'-dimethylbenzidine (66.6) 1,3,5-trinitrobenzene (68.4) diallate (67.1) kepone (79.7)	+/-	J/UJ
054CB03301 054CB03701	4-nitroquinoline-1-oxide (236.5) hexachlorophene (164.3)	+/-	J/R
054CB03301 054CB03701	aramite methapyriline (77.5)	+/-	J/R
054CB03301	bis(2-ethylhexyl)phthalate	+	CRQL
054CB03701	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



# HEARTLAND

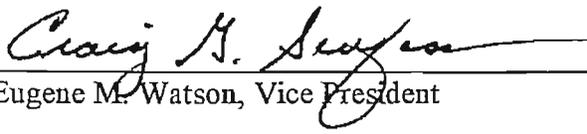
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24170B  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: November 29 -30, 1995  
Number of Samples: 2 Aqueous Sample(s) with 0 MS/MSD(s)  
25 Non-aqueous Sample(s) with 3 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, Pesticides/PCB's, Organotins

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:

  
Eugene M. Watson, Vice President

3-13-96  
Date

## SDG# 24170B

## Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	ORG
054SB03302	SOIL	X	X		X
054SB03401	SOIL	X	X		X
054TB03401	WATER	X			
083SB00101	SOIL	X	X	X	X
083SB00102	SOIL	X	X	X	X
084SB00101	SOIL	X	X	X	X
084TB00101	WATER	X			
084SB00102	SOIL	X	X	X	X
574SB00101	SOIL	X	X	X	X
574SB00102	SOIL	X	X	X	X
574SB00201	SOIL	X	X	X	X
574SB00202	SOIL	X	X	X	X
574SB00301	SOIL	X	X	X	X
574SB00302	SOIL	X	X	X	X
574SB00401	SOIL	X	X	X	X
574SB00402	SOIL	X	X	X	X
574SB00501	SOIL	X	X	X	X
574SB00502	SOIL	X	X	X	X
054SB03301	SOIL		X		X
054SB03501	SOIL		X		X
054SB03502	SOIL		X		X
054SB03601	SOIL		X		X
054SB03701	SOIL		X		X
054SB03801	SOIL		X		X
054SB03901	SOIL		X		X
054SB04001	SOIL		X		X
054SB04002	SOIL		X		X
Total Billable Samples (Water/Soil)		2 16	0 25	0 14	0 24

VOA = SW846 Volatiles  
SV = SW846 Semivolatiles  
P/P = SW846 Pesticides/PCB's  
ORG = SW846 Organotins

## 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, June 1991, 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 # 24170B

A validation was performed on the Volatile Data from SDG 24170B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, K12554, 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).

083SB00102	acetone (28.1)
054SB03401	
574SB00301RE	
054SB03302	
574SB00101RE	
574SB00302	
083SB00101RE	
574SB00201RE	
574SB00501	
574SB00102	
574SB00401DL	

**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).

574SB00101	chlorobenzene-d <sub>3</sub>
574SB00201	
574SB00301	
574SB00301RE	
574SB00101RE	
574SB00201RE	
574SB00501	
574SB00102	bromochloromethane
574SB00501RE	1,4-difluorobenzene
574SB00102RE	chlorobenzene-d <sub>3</sub>

DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 3

**Trip Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
084TB00101	methylene chloride	8 ug/L	80 ug/L

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
084SB00101	methylene chloride	U

084SB00102  
574SB00101  
574SB00201  
574SB00202  
574SB00301  
574SB00401  
574SB00402  
574SB00502  
083SB00101

574SB00101RE	methylene chloride	CRQL
574SB00201RE		
574SB00301RE		
574SB00302		
574SB00501		
574SB00501RE		
083SB00101RE		
083SB00102		

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 4**

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

574SB00301	toluene-d <sub>8</sub>	130
574SB00401	toluene-d <sub>8</sub>	121
	bromofluorobenzene	129
083SB00101	toluene-d <sub>8</sub>	119
574SB00301RE	toluene-d <sub>8</sub>	126
574SB00101RE	toluene-d <sub>8</sub>	121
083SB00101RE	toluene-d <sub>8</sub>	121
574SB00201RE	toluene-d <sub>8</sub>	134
574SB00501	toluene-d <sub>8</sub>	126
574SB00102	toluene-d <sub>8</sub>	122
574SB00401DL	toluene-d <sub>8</sub>	124
574SB00501RE	toluene-d <sub>8</sub>	144
574SB00102RE	toluene-d <sub>8</sub>	146

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit and the were less than the QA/QC limits. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

574SB00101	toluene-d <sub>8</sub>	130
	bromofluorobenzene	63
574SB00201	toluene-d <sub>8</sub>	121
	bromofluorobenzene	72

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 5**

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

574SB00101

574SB00201

574SB00301RE

083SB00101RE

574SB00501RE

574SB00102RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
083SB00102 054SB03401 574SB00301RE 054SB03302 574SB00101RE 574SB00302 083SB00101RE 574SB00201RE 574SB00501 574SB00102 574SB00401DL	acetone (28.1)	+	J
574SB00101 574SB00201 574SB00301 574SB00301RE 574SB00101RE 574SB00201RE 574SB00501	All associated analytes chlorobenzene-d <sub>5</sub>	+	J/UJ
574SB00102 574SB00501RE 574SB00102RE	bromochloromethane 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>		
084SB00101 084SB00102 574SB00101 574SB00201 574SB00202 574SB00301 574SB00401 574SB00402 574SB00502 083SB00101	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

Page - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
574SB00101RE 574SB00201RE 574SB00301RE 574SB00302 574SB00501 574SB00501RE 083SB00101RE 083SB00102	methylene chloride	+	CRQL
574SB00301 574SB00401 083SB00101 574SB00301RE 574SB00101RE 574SB00201RE 574SB00501 574SB00102 574SB00401DL 574SB00501RE 574SB00102RE	All analytes	+	J
574SB00101 574SB00201	All analytes	+/-	J/UJ
574SB00101 574SB00201 574SB00301RE 083SB00101RE 574SB00501RE 574SB00102RE	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 SW846, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

### SDG # 24170B

A validation was performed on the Semivolatile Data from SDG 24170B. 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

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action level</u>
SBLK1	bis(2-ethylhexyl)phthalate	83J	830
<u>Samples</u>	<u>Compound</u>		<u>Qualification</u>
083SB00102	bis(2-ethylhexyl)phthalate		CRQL
054SB03301			
054SB03302			
054SB03801			
054SB03701	bis(2-ethylhexyl)phthalate		U

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE ANALYSIS

PAGE - 2

#### Method Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action level</u>
SBLK2	bis(2-ethylhexyl)phthalate	510J	5100

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
083SB00101	bis(2-ethylhexyl)phthalate	U
574SB00101		
574SB00301		
574SB00402		

574SB00201	bis(2-ethylhexyl)phthalate	CRQL
574SB00202		
574SB00502		
574SB00102		
574SB00302		
574SB00401		

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
083SB00102 054SB03301 054SB03302 054SB03801	bis(2-ethylhexyl)phthalate	+	CRQL
054SB03701	bis(2-ethylhexyl)phthalate	+	U
083SB00101 574SB00101 574SB00301 574SB00402	bis(2-ethylhexyl)phthalate	+	U
574SB00201 574SB00202 574SB00502 574SB00102 574SB00302 574SB00401	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



# HEARTLAND

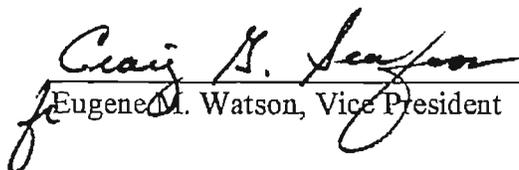
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24170A  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: November 29 - 30, 1995  
Number of Samples: 25 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: 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:

  
Eugene M. Watson, Vice President

3-14-96  
Date

SDG# 24170A

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	TAL	CN
054SB03601	SOIL	X	
054SB03701	SOIL	X	
054SB03801	SOIL	X	
054SB03901	SOIL	X	
054SB04001	SOIL	X	
054SB03301	SOIL	X	
054SB03302	SOIL	X	
054SB03401	SOIL	X	
054SB03501	SOIL	X	
054SB03502	SOIL	X	
054SB04002	SOIL	X	
083SB00101	SOIL	X	X
083SB00102	SOIL	X	X
084SB00101	SOIL	X	X
084SB00102	SOIL	X	X
574SB00101	SOIL	X	X
574SB00102	SOIL	X	X
574SB00201	SOIL	X	X
574SB00202	SOIL	X	X
574SB00301	SOIL	X	X
574SB00302	SOIL	X	X
574SB00401	SOIL	X	X
574SB00402	SOIL	X	X
574SB00501	SOIL	X	X
574SB00502	SOIL	X	X
Total Billable Samples (Water/Soil)		0 25	0 14

TAL= SW846 Metals

CN= SW846 Cyanide

## 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 # 24170

A validation was performed on the Metals Data from SDG 24170. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.16 mg/kg	no impact
Iron	2.07 mg/kg	no impact
Lead	0.41 mg/kg	no impact
Potassium	109 mg/kg	all soil samples below 545 mg/kg
Sodium	16.4 mg/kg	all soil samples below 82.0 mg/kg

Tin	3.44 mg/kg	all soil samples below 17.2 mg/kg
Nickel	0.43 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 Mercury (16%) was below 30%. All non-detect results are rejected and all positive results are qualified as estimated, "J".

The Matrix Spike recoveries for Antimony (67%) and Tin (71%) were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recovery for Lead (206%) was above the upper control limits. All positive results are qualified as estimated, "J".

## Duplicate Analysis

### Specific Finding

The Field Duplicate analyses for Calcium, Manganese, Nickel and Tin were outside the control limits of 50%. All positive results are qualified as estimated, "J" >

### 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 545 mg/kg	K.	+	U
all soil samples below 82.0 mg/kg	Na.		
all soil samples below 17.2 mg/kg	Sn.		
all soil samples	Hg.	+	J
		U	R
all soil samples	Sb and Sn.	+/U	J/UJ
all soil samples	Pb.	+	J
all soil samples	Ca, Na, Mn and Sn.	+	J
All "B" results	all analytes	B	J



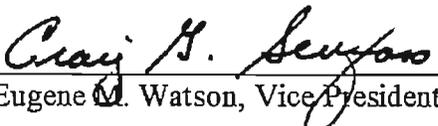
**HEARTLAND**  
ENVIRONMENTAL SERVICES, INC.

**Data Validation Report**

SDG#: 24170B  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: November 29 - 30, 1995  
Number of Samples: 2 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Metals, Hexavalent Chromium

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:

  
Eugene M. Watson, Vice President

3-14-96  
Date

SDG# 24170B

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	TAL		HCR	
054CB03701	SOIL		X		X
054CB03301	SOIL		X		X
Total Billable Samples (Water/Soil)		0	2	0	2

TAL = SW846 Metals

HCR = SW846 Hexavalent Chromium

# DATA ASSESSMENT NARRATIVE METALS, HEXAVALENT CHROMIUM 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 # 24170

A validation was performed on the Metals Data from SDG 24170. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.12 mg/kg	no impact
Sodium	21.2 mg/kg	all soil samples below 106 mg/kg
Tin	3.28 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Potassium	-15.8 mg/kg	no impact

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

## Serial Dilution Analysis

### Specific Finding

The Serial Dilution for field duplicate samples for Nickel was outside the control limits. All positive results are qualified as estimated, "J".

### 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 106 mg/kg	Na.	+	U
all field duplicates	Ni.	+	J
All "B" results	all analytes	B	J

# 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, June 1991, 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 # 24206B

A validation was performed on the Volatile Data from SDG 24206B, 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

### Internal Standards

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

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

PAGE - 2

**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).

084SB00301	chlorobenzene-d <sub>5</sub>
084SB00401RE	
 084SB00301RE	 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>

**Trip Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
084TB00601	methylene chloride	1	33
	acetone	6	200
<u>Samples</u>	<u>Compound</u>		<u>Qualification</u>
084SB00201	acetone		U
084SB00301			
084SB00301RE			
084SB00401			
084SB00401RE			
084SB00302	acetone		CRQL
084SB00502			
084SB00601			
084SB00301	methylene chloride		CRQL
084SB00301RE			
084SB00401			
084SB00401RE			
084SB00402			
084SB00501			
084SB00601			
084SB00602			

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

PAGE - 3

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

084SB00301	toluene-d <sub>8</sub>	126
084SB00401	toluene-d <sub>8</sub>	118
084SB00401RE	toluene-d <sub>8</sub>	137

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

084SB00401RE  
084SB00301RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
084SB00301 084SB00401RE	All associated analytes chlorobenzene-d <sub>5</sub>	+/-	J/UJ
084SB00301RE	1,4-difluorobenzene chlorobenzene-d <sub>5</sub>		
084SB00201 084SB00301 084SB00301RE 084SB00401 084SB00401RE	acetone	+	U
084SB00302 084SB00502 084SB00601	acetone	+	CRQL
084SB00301 084SB00301RE 084SB00401 084SB00401RE 084SB00402 084SB00501 084SB00601 084SB00602	methylene chloride	+	CRQL
084SB00301 084SB00401 084SB00401RE	All analytes	+	J
084SB00401RE 084SB00301RE	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



# HEARTLAND

ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24206  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 1, 1995  
Number of Samples: 10 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: 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:

  
Eugene M. Watson, Vice President

3-15-96  
Date

SDG# 24206

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	TAL		CN	
084SB00201	SOIL		X		X
084SB00202	SOIL		X		X
084SB00301	SOIL		X		X
084SB00302	SOIL		X		X
084SB00401	SOIL		X		X
084SB00402	SOIL		X		X
084SB00501	SOIL		X		X
084SB00502	SOIL		X		X
084SB00601	SOIL		X		X
084SB00602	SOIL		X		X
Total Billable Samples (Water/Soil)		0	10	0	10

TAL= SW846 Metals

CN= SW846 Cyanide

# 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 # 24206

A validation was performed on the Metals Data from SDG 24206. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.15 mg/kg	no impact
Iron	2.41 mg/kg	no impact
Manganese	0.17 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Potassium	-98.5 mg/kg	all soil samples below 985 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 (55%) and Manganese (38%) were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spik recoveries for Copper (158%) and Mercury (161%) were above the upper control limits. All positive results are qualified as estimated, "J".

## Duplicate Analysis

### Specific Finding

The Duplicate analyses for Iron and Zinc were outside the control limits of 35%. All positive results are qualified as estimated, "J".

### 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 985 mg/kg	K.	+/U	J/UJ
all soil samples	Sb and Mn.	+/U	J/UJ
all soil samples	Cu and Hg.	+	J
all soil samples	Fe and Zn.	+	J
All "B" results	all analytes	B	J



# HEARTLAND

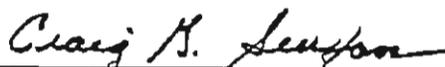
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24206  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 1, 1995  
Number of Samples: 10 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: 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:

  
Eugene M. Watson, Vice President

3-15-96  
Date

SDG# 24206

### Samples and Fractions Reviewed

Sample Identifications      Analytical Fractions

ENSAFE ID	MATRIX	TAL	CN		
084SB00201	SOIL	X	X		
084SB00202	SOIL	X	X		
084SB00301	SOIL	X	X		
084SB00302	SOIL	X	X		
084SB00401	SOIL	X	X		
084SB00402	SOIL	X	X		
084SB00501	SOIL	X	X		
084SB00502	SOIL	X	X		
084SB00601	SOIL	X	X		
084SB00602	SOIL	X	X		
Total Billable Samples (Water/Soil)		0	10	0	10

TAL = SW846 Metals  
CN = SW846 Cyanide

## 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 # 24206 .

A validation was performed on the Metals Data from SDG 24206. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.15 mg/kg	no impact
Iron	2.41 mg/kg	no impact
Manganese	0.17 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Potassium	-98.5 mg/kg	all soil samples below 985 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 (55%) and Manganese (38%) were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spik recoveries for Copper (158%) and Mercury (161%) were above the upper control limits. All positive results are qualified as estimated, "J".

### Duplicate Analysis

#### Specific Finding

The Duplicate analyses for Iron and Zinc were outside the control limits of 35%. All positive results are qualified as estimated, "J".

#### 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 985 mg/kg	K.	+/U	J/UJ
all soil samples	Sb and Mn.	+/U	J/UJ
all soil samples	Cu and Hg.	+	J
all soil samples	Fe and Zn.	+	J
All "B" results	all analytes	B	J

## 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, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24206B

A validation was performed on the Semivolatile Data from SDG 24206B. 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

#### 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

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



# HEARTLAND

ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24206S  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 1, 1995  
Number of Samples: 10 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: Organotins

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:

*Kimberly S. Stopp*  
for Eugene M. Watson, Vice President

*20 March 1996*  
Date

SDG# 24206S

### Samples and Fractions Reviewed

Sample Identifications    Analytical Fractions

ENSAFE ID	MATRIX	ORG
084SB00201	SOIL	X
084SB00202	SOIL	X
084SB00301	SOIL	X
084SB00302	SOIL	X
084SB00401	SOIL	X
084SB00402	SOIL	X
084SB00501	SOIL	X
084SB00502	SOIL	X
084SB00601	SOIL	X
084SB00602	SOIL	X
Total Billable Samples (Water/Soil)		0 10

ORG= SW846 Organotins

## DATA ASSESSMENT NARRATIVE

### SEMIVOLATILES - ORGANOTINS

#### 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, calibration results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8270, modified for organotins; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24206S

A validation was performed on the organotin data from SDGs 24206S. 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
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

#### Overall Performance

Overall performance was acceptable.

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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



# HEARTLAND

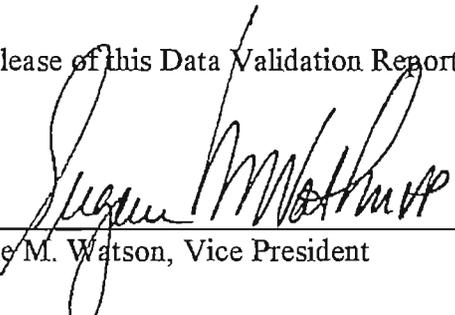
ENVIRONMENTAL SERVICES, INC.

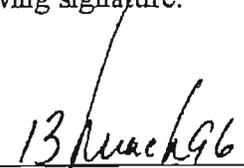
## Data Validation Report

SDG#: 24206B  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 1, 1995  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
10 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, Pesticides/PCB's

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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

  
\_\_\_\_\_  
Date

SDG# 24206B

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P			
084SB00201	SOIL	X	X	X			
084SB00202	SOIL	X	X	X			
084SB00301	SOIL	X	X	X			
084SB00302	SOIL	X	X	X			
084SB00401	SOIL	X	X	X			
084SB00402	SOIL	X	X	X			
084SB00501	SOIL	X	X	X			
084SB00502	SOIL	X	X	X			
084SB00601	SOIL	X	X	X			
084TB00601	WATER	X					
084SB00602	SOIL	X	X	X			
Total Billable Samples (Water/Soil)		1	10	0	10	0	10

VOA = SW846 Volatiles  
SV = SW846 Semivolatiles  
P/P = SW846 Pesticides

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24206

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24206. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### Calibration

The initial calibration exhibited non-linearity with %RSD values greater than 15% and less than 90%.

<u>ANALYTE ID</u>	<u>% RSD</u>
alpha-BHC	22.33
delta-BHC	28.17
gamma-BHC	19.13
Aldrin	17.46
4,4'-DDE	15.6
Dieldrin	18.92

Qualify all positive results for the non-linear compounds as estimated.

## **Surrogates**

One sample (084SB00401, %REC DCB-1 = 387, %REC DCB-2 = 168) exhibited DCB with a percent recovery greater than the upper limit. Qualify all positive results as estimated (J).

## **System Performance and Overall Assessment**

Overall performance was acceptable. The data did require qualifications/rejections stated above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
084SB00402	alpha-BHC	+	J
084SB00402	delta-BHC	+	J
084SB00402	gamma-BHC	+	J
084SB00402	Aldrin	+	J
084SB00402	4,4'-DDE	+	J
084SB00402	Dieldrin	+	J

<u>SAMPLE ID</u>	<u>SURROGATE</u>	<u>%REC</u>
084SB00401	DCB-1	387%
084SB00401	DCB-2	168%

- \* 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



# HEARTLAND

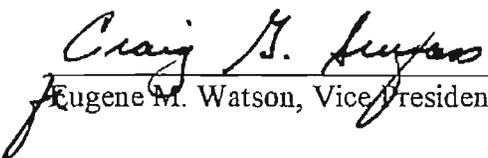
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24212  
Date: February 8, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 4, 1995  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
2 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Volatiles, Semivolatiles, Pesticides/PCB's, Organophosphorus Pesticides, Organotins, Metals, Hexavalent Chromium, pH, Dioxin/Furans, Cyanide, Petroleum Hydrocarbons

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:

  
Eugene M. Watson, Vice President

3-15-96  
Date

SDG# 24212

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA		SV		P/P		HERB		OPP		ORG		D/F		HCR		pH		TPH		TAL/CN	
065CB00101	SOIL		X		X		X		X		X		X		X		X		X		X		X
065CB00102	SOIL		X		X		X		X		X		X		X		X		X		X		X
084DB00501	WATER	X		X		X		X		X		X		X		X		X		X		X	
Total Billable Samples (Water/Soil)		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- P/P = SW846 Pesticides/PCB's
- HERB = SW846 Herbicides
- OPP = SW846 Organophosphorus Pesticides
- ORG = SW846 Organotins
- D/F = SW846 Dioxin/Furans
- HCR = SW846 Hexavalent Chromium
- pH = SW846 pH
- TAL/CN = SW846 Metals w/Cyanide
- TPH = SW846 Petroleum Hydrocarbons

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; 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 # 24212

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24212. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### Surrogate Recoveries

Two samples exhibit percent recoveries greater than 10% and less than the lower limit. Qualify all positive results as estimated (J) and all non-detect results as estimated (UJ).

<u>Sample ID</u>	<u>Surrogate</u>	<u>%Rec</u>
065CB00101	DCB-1	34
065CB00102	DCB-1	30
065CB00102	DCB-2	34

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did require qualifications/rejections as stated above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
065CB00101 065CB00102	ALL	+/-	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

### 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 8240 Appendix IX; 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 # 24212A

A validation was performed on the Volatile Data from SDG 24212A. 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. Qualifications are required.

## DATA ASSESSMENT AND NARRATIVE

### VOLATILE ANALYSIS

PAGE - 2

#### Continuing calibrations (continued)

##### Specific Finding:

The continuing calibration, U1627.D, contained compounds with %Ds greater than 25%, and 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).

065CB00101	2-chloroethyl vinyl ether (0.022)
065CB00102	acrolein (0.010 and 41.2%)
	Isobutyl alcohol (0.008)
	1,4-dioxane (0.001)

#### Blank

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 considerations when applying the 5X and 10X criteria to field samples.

#### Trip Blank

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>	<u>Action Level</u>
526TB00301	methylene chloride	2J	20
	Acetone	3J	30

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
065CB00101	methylene chloride	CRQL
065CB00102	acetone	U

#### Compound Identification /Quantitation

Reject E-flagged results for sample 065CB00101, in favor of dilution D-flagged results for sample 065CB00101DL.

## **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

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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
065CB00101 065CB00102	2-chloroethyl vinyl ether acrolein Isobutyl alcohol 1,4-dioxane	+/-	J/R
065CB00101	methylene chloride	+	CRQL
065CB00102	acetone	+	U
065CB00101	E-flagged results	+	R
065CB00101DL	All results 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

### 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 8240; the National Functional Guidelines for Organic Data Review, June 1991, 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 # 24212B

A validation was performed on the Volatile Data from SDG 24212B. 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

#### Blank

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 considerations when applying the 5X and 10X criteria to field samples.

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

**Trip Blank**

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>	<u>Action Level</u>
526TB00301	methylene chloride	2J	20
	Acetone	3J	30

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
065SB00102 526SB00301 526SB00302 526SB00901 526SB00902	methylene chloride	CRQL
526SB00301 526SB00901	acetone	CRQL
526SB00902	acetone	U

**Rinseate Blank**

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>	<u>Action Level</u>
084EB00501	2-butanone	2J	20

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
065SB00102	2-butanone	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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
065SB00102 526SB00301 526SB00302 526SB00901 526SB00902	methylene chloride	+	CRQL
526SB00301 526SB00901	acetone	+	CRQL
526SB00902	acetone	+	U
065SB00102	2-butanone	+	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

## DIOXIN/FURANS - 8290

### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24212

A validation was performed on the Dioxin/Furan Data from SDG 24212. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- \* • Blanks
- \* • Laboratory Control Samples
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

### Blanks

Congener ID	MB Conc. (pg/L)	084DB00501	Q
OCDD	5.2	7.93	U

## 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                      COMPOUND ID                      DL                      QL

NO QUALIFICATIONS WERE 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 METALS HEXAVALENT CHROMIUM 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 # 24212

A validation was performed on the Metals Data from SDG 24212. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.17 mg/kg	no impact
Iron	2.07 mg/kg	no impact
Lead	0.41 mg/kg	no impact
Potassium	45.3 mg/kg	no impact
Sodium	18.6 mg/kg	all soil samples below 93.0 mg/kg

Tin 3.44 mg/kg all soil samples below 17.2 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.

#### 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 93.0 mg/kg	Na.	+	U
all soil samples below 17.2 mg/kg	Sn.		
All "B" results	all analytes	B	J



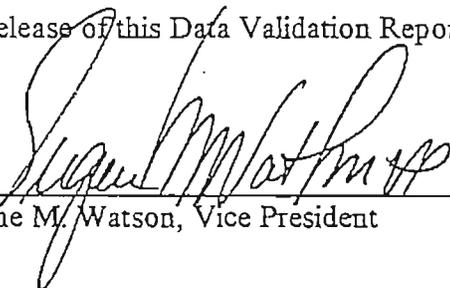
**HEARTLAND**  
ENVIRONMENTAL SERVICES, INC.

**Data Validation Report**

SDG#: 24212B  
Date: February 8, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 4, 1995  
Number of Samples: 2 Aqueous Sample(s) with 0 MS/MSD(s)  
8 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest laboratory of Oklahoma  
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, Pesticides w/PCB's, PCB's, Organotins, Metals, pH, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

  
\_\_\_\_\_  
Date

SDG# 24212B

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	PCB	ORG	TAL	pH	CN								
065SB00101	SOIL	X	X	X		X	X	X	X								
065SB00102	SOIL	X	X	X		X	X	X	X								
084EB00501	WATER	X					X		X								
526SB00301	SOIL	X	X	X	X	X	X										
526SB00302	SOIL	X	X	X	X	X	X		X								
526SB00901	SOIL	X	X	X		X	X		X								
526SB00902	SOIL	X	X	X		X	X		X								
526SB00401	SOIL					X											
526SB00402	SOIL					X											
562TB00301	WATER	X															
Total Billable Samples (Water/Soil)		2	6	0	6	0	6	0	4	0	6	1	6	0	2	1	5

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- P/P = SW846 Pesticides/PCB's
- PCB = SW846 PCB's
- ORG = SW846 Organotins
- TAL = SW846 Metals
- pH = SW846 pH
- CN = SW846 Cyanide

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24212

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24212. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### Surrogates

One sample (526SB00301, %REC = 33) exhibited DCB with a percent recovery greater than 10% and less than the lower limit. Qualify all positive results as estimated (J) and all non-detect results as estimated (UJ).

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did require qualifications/rejections stated above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>SURROGATE</u>	<u>%REC</u>
526SB00301	DCB-2	33%

## 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 8240 Appendix IX; 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 # 24212A

A validation was performed on the Volatile Data from SDG 24212A. 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. Qualifications are required.

## DATA ASSESSMENT AND NARRATIVE

### VOLATILE ANALYSIS

PAGE - 2

#### Continuing calibrations (continued)

##### Specific Finding:

The continuing calibration, U1627.D, contained compounds with %Ds greater than 25 %, and 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).

065CB00101	2-chloroethyl vinyl ether (0.022)
065CB00102	acrolein (0.010 and 41.2%)
	Isobutyl alcohol (0.008)
	1,4-dioxane (0.001)

#### Blank

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 considerations when applying the 5X and 10X criteria to field samples.

#### Trip Blank

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>	<u>Action Level</u>
526TB00301	methylene chloride	2J	20
	Acetone	3J	30

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
065CB00101	methylene chloride	CRQL
065CB00102	acetone	U

#### Compound Identification /Quantitation

Reject E-flagged results for sample 065CB00101, in favor of dilution D-flagged results for sample 065CB00101DL.

**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

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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
065CB00101 065CB00102	2-chloroethyl vinyl ether acrolein Isobutyl alcohol 1,4-dioxane	+/-	J/R
065CB00101	methylene chloride	+	CRQL
065CB00102	acetone	+	U
065CB00101	E-flagged results	+	R
065CB00101DL	All results 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 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 # 24212

A validation was performed on the Metals Data from SDG 24212. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.17 mg/kg	no impact
Iron	2.07 mg/kg	no impact
Lead	0.41 mg/kg	no impact
Potassium	45.3 mg/kg	no impact
Sodium	18.6 mg/kg	all soil samples below 93.0 mg/kg

Tin 3.44 mg/kg all soil samples below 17.2 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.

#### Field Duplicate Analysis

##### Specific Finding

The Field Duplicate Analysis for Calcium (69%) was greater than 50%. All positive results are qualified as estimated, "J".

#### Serial Dilution Analysis

##### Specific Finding

The Serial Dilutions for Calcium, Magnesium and Potassium were outside the control limits of 10%. All positive results are qualified as estimated, "J".

##### 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 93.0 mg/kg	Na.	+	U
all soil samples below 17.2 mg/kg	Sn.		
all soil samples	Ca.	+	J
all soil samples	Ca, Mg and K.	+	J
All "B" results	all analytes	B	J

# DATA ASSESSMENT NARRATIVE METALS HEXAVALENT CHROMIUM 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 # 24212

A validation was performed on the Metals Data from SDG 24212. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.17 mg/kg	no impact
Iron	2.07 mg/kg	no impact
Lead	0.41 mg/kg	no impact
Potassium	45.3 mg/kg	no impact
Sodium	18.6 mg/kg	all soil samples below 93.0 mg/kg

Tin 3.44 mg/kg all soil samples below 17.2 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.

#### 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 Ensafé's request.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 93.0 mg/kg	Na.	+	U
all soil samples below 17.2 mg/kg	Sn.		
All "B" results	all analytes	B	J

# DATA ASSESSMENT NARRATIVE

## ORGANOPHOSPHORUS PESTICIDES

### 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 8140; 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 # 24212A

A validation was performed on the Organophosphorus Pesticide Data from SDG 24212A. 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.

### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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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

## CHLORINATED HERBICIDES

### 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 8150; 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 # 24212A

A validation was performed on the Herbicide Data from SDG 24212A. 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.

### 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

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 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, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24212B

A validation was performed on the Semivolatile Data from SDG 24212B. 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.

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE ANALYSIS

PAGE - 2

#### Continuing calibrations (continued)

#### Specific Finding:

The continuing calibration, T15160, 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 detect as estimated (UJ).

526SB00302	3,3'-dichlorobenzidine (-51.6)
526SB00902	
065SB00101	
065SB00102	
084EB00501	

#### Method Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
SBLK1	diethylphthalate	410J	4100
	dimethyl phthalate	130J	1300

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
065SB00101	diethylphthalate	CRQL
065SB00102		
526SB00302		
526SB00902		
526SB00301		
526SB00901		

526SB00301	dimethyl phthalate	CRQL
526SB00901		

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
526SB00302 526SB00902 065SB00101 065SB00102 084EB00501	3,3'-dichlorobenzidine (-51.6)	+/-	J/UJ
065SB00101 065SB00102 526SB00302 526SB00902 526SB00301 526SB00901	diethylphthalate	+	CRQL
526SB00301 526SB00901	dimethyl 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 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, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24212A

A validation was performed on the Semivolatile Data from SDG 24212A. 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.

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE ANALYSIS

PAGE - 2

#### Continuing calibrations (continued)

#### Specific Finding:

The continuing calibration, A0532,-533,- 534.-535,-536,-537, -539, 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 detect as estimated (UJ).

065CB00101	3,3'-dimethylbenzidine (66.6)
065CB00102	1,3,5-trinitrobenzene (68.4)
084DB00501	diallate (67.1)
	kepone (79.7)

The continuing calibration, A0532,-533,- 534.-535,-536,-537, -539, 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 detect (R).

065CB00101	4-nitroquinoline-1-oxide (236.5)
065CB00102	hexachlorophene (164.3)
084DB00501	

The continuing calibration, A0532,-533,- 534.-535,-536,-537, -539, 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).

065CB00101	aramite
065CB00102	methapyriline (77.5)
084DB00501	

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
065CB00101	3,3'-dimethylbenzidine (66.6)	+/-	J/UJ
065CB00102	1,3,5-trinitrobenzene (68.4)		
084DB00501	diallate (67.1) kepone (79.7)		
065CB00101	4-nitroquinoline-1-oxide (236.5)	+/-	J/R
065CB00102	hexachlorophene (164.3)		
084DB00501			
065CB00101	aramite	+/-	J/R
065CB00102	methapyrilone (77.5)		
084DB00501			

- \* 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

### SEMIVOLATILES - ORGANOTINS

#### 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, calibration results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8270, modified for organotins; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24212S

A validation was performed on the organotin data from SDGs 24212S. 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
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

#### Matrix Spike/Matrix Spike Duplicates

The MS/MSD pair and the LCS/LCSD pair exhibited 0% recovery for tributyltin. The laboratory noted in the case narrative that problems have developed with the recovery of this compound. Therefore, based on the lack of data supporting that the compound can be recovered in the DI water or the sample matrix, non-detect results required rejection in the samples.

**DATA ASSESSMENT NARRATIVE  
SEMIVOLATILES - ORGANOTINS**

**PAGE 2**

**Matrix Spike/Matrix Spike Duplicates, continued**

**Specific Finding**

Reported positive results required qualification as estimated, J, and non-detect results required rejection, R, due to 0% recoveries in the MS/MSD pair and LCS/LCSD pair for the compound tributyltin in all samples.

**Overall Performance**

Overall performance was not acceptable.

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
ALL SAMPLES	TRIBUTYLTIN	+/-	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

# DATA ASSESSMENT NARRATIVE

## SEMIVOLATILES - ORGANOTINS

### 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, calibration results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8270, modified for organotins; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24212F

A validation was performed on the organotin data from SDGs 24212F. 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
- \*     •     Identification/Quantitation

\* - All criteria were met for this parameter.

### Overall Performance

Overall performance was acceptable.

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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



# HEARTLAND

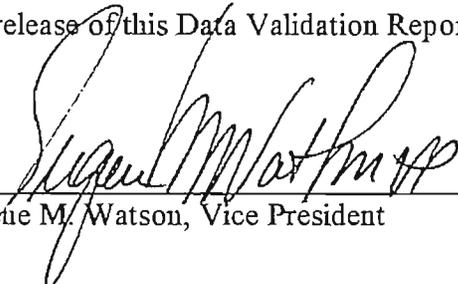
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24212B  
Date: February 8, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 4, 1995  
Number of Samples: 2 Aqueous Sample(s) with 0 MS/MSD(s)  
8 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest laboratory of Oklahoma  
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, Pesticides w/PCB's, PCB's, Organotius, Metals, pH, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

  
\_\_\_\_\_  
Date

SDG# 24212B

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	PCB	ORG	TAL	pH	CN								
065SB00101	SOIL	X	X	X		X	X	X	X								
065SB00102	SOIL	X	X	X		X	X	X	X								
084EB00501	WATER	X					X		X								
526SB00301	SOIL	X	X	X	X	X	X										
526SB00302	SOIL	X	X	X	X	X	X		X								
526SB00901	SOIL	X	X	X		X	X		X								
526SB00902	SOIL	X	X	X		X	X		X								
526SB00401	SOIL					X											
526SB00402	SOIL					X											
562TB00301	WATER	X															
Total Billable Samples (Water/Soil)		2	6	0	6	0	6	0	4	0	6	1	6	0	2	1	5

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- P/P = SW846 Pesticides/PCB's
- PCB = SW846 PCB's
- ORG = SW846 Organotins
- TAL = SW846 Metals
- pH = SW846 pH
- CN = SW846 Cyanide

**DATA ASSESSMENT NARRATIVE**  
**CHLORINATED PESTICIDES/PCBs**

**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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24212**

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24212. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

**Surrogates**

One sample (526SB00301, %REC = 33) exhibited DCB with a percent recovery greater than 10% and less than the lower limit. Qualify all positive results as estimated (J) and all non-detect results as estimated (UJ).

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did require qualifications/rejections stated above.

## 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

<u>SAMPLE ID</u>	<u>SURROGATE</u>	<u>%REC</u>
526SB00301	DCB-2	33%



# HEARTLAND

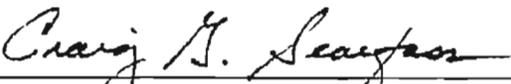
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24213 (24212)  
Date: April 12, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 4, 1995  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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 III  
Method(s) Utilized: SW846 Third Edition  
Analytical Fractions: Gasoline Range Organics, Diesel Range Organics

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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

4-12-96  
\_\_\_\_\_  
Date

SDG# 24213 (24212)

### Samples and Fractions Reviewed

Sample Identifications      Analytical Fractions

ENSAFE ID	MATRIX	GRO		DRO	
084DB00501	WATER	X		X	
Total Billable Samples (Water/Soil)		1	0	1	0

GRO= SW846 Gasoline range Organics

DRO= SW846 Diesel Range Organics

## DATA ASSESSMENT NARRATIVE

### TPH - EXTRACTABLES AND PURGEABLES

#### 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, calibration results, surrogate and matrix spike recoveries, and GC performance. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8015, modified for extractable and purgeable TPH; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24213 (24212)

A validation was performed on the TPH by GC data from SDG 24213. 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
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

#### Overall Performance

Overall performance was acceptable.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
084DB00501	OCDD	+B	NA

- \* 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 8240; the National Functional Guidelines for Organic Data Review, June 1991, 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 # 24230B

A validation was performed on the Volatile Data from SDG 24230B. 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. Qualifications are required.

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, UJ255.D, 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).

562SB00101 vinyl acetate (51.2%)  
562SB00102

The continuing calibration, UJ255.D, contained compounds with 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).

562SB00101 2-chloroethyl vinyl ether (0.028)  
562SB00102

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).

081CC00301 Bromochloromethane  
1,4-difluorobenzene  
chlorobenzene-d<sub>5</sub>

Blank

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 considerations when applying the 5X and 10X criteria to field samples.

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

**Trip Blank**

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>	<u>Action Level</u>
526TB00201	methylene chloride	1J	10
	Acetone	6J	60

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
081CC00101	methylene chloride	U
081CC00101	methylene chloride	CRQL
562SB00101		
562SB00102		
081CC00101	acetone	U
081CC00301		
562SB00202		
081CC00301	acetone	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<sub>8</sub>. Qualify all positive results as estimated (J).

081CC00301 (122%)

**Compound Identification /Quantitation**

Reject all results for 081CC00301RE, in favor of the initial analysis, due to non compliant internal standard areas and surrogate recoveries.

## DATA ASSESSMENT AND NARRATIVE

### VOLATILE ANALYSIS

PAGE - 4

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
562SB00101 562SB00102	vinyl acetate	+/-	J/UJ
562SB00101 562SB00102	2-chloroethyl vinyl ether	+/-	J/R
081CC00301	All associated analytes Bromochloromethane 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>	+/-	J/UJ
081CC00101	methylene chloride	+	U
081CC00101 562SB00101 562SB00102	methylene chloride	+	CRQL
081CC00101 081CC00301 562SB00202	acetone	+	U
081CC00301	acetone	+	CRQL
081CC00301	all analytes	+	J
081CC00301RE	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 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 # 24230

A validation was performed on the Metals Data from SDG 24230. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.16 mg/kg	no impact
Iron	2.07 mg/kg	no impact
Lead	0.41 mg/kg	no impact
Potassium	39.9 mg/kg	no impact
Sodium	15.4 mg/kg	no impact

Tin 3.44 mg/kg all soil samples below 17.2 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.

### Serial Dilution Analysis

#### Specific Finding

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

#### 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 17.2 mg/kg	Sn.	+	U
all soil samples	Ca and K.	+	J
All "B" results	all analytes	B	J



# HEARTLAND

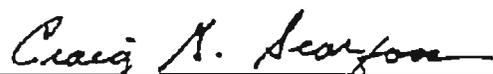
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24230  
Date: February 8, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 5 - 7, 1995  
Number of Samples: 4 Aqueous Sample(s) with 0 MS/MSD(s)  
8 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, pesticides w/PCB's, PCB's, Organotins, Metals, pH, 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:

  
Eugene M. Watson, Vice President

3-14-96  
Date

SDG# 24230

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRX	VOA	SV	P/P	PCB	ORG	TAL	pH	CN								
065EW00101	WATER	X	X	X			X		X								
081CC00101	SOIL	X	X	X		X	X		X								
081CC00201	SOIL	X	X	X		X	X		X								
081CC00301	SOIL	X	X	X		X	X		X								
526TB00201	WATER	X															
562SB00101	SOIL	X				X											
562SB00102	SOIL	X				X											
562SB00202	SOIL	X				X											
GDETW19D01	WATER	X															
GDEEW19D01	WATER	X	X	X			X		X								
562SB00201	SOIL					X											
579CC00101	SOIL					X	X	X									
Total Billable Samples (Water/Soil)		4	6	2	3	2	3	0	5	0	3	2	4	0	1	2	3

- VOA= SW846 Volatiles
- SV= SW846 Semivolatiles
- P/P= SW846 Pesticides/PCB's
- PCB= SW846 PCB's
- ORG= SW846 Organotins
- TAL= SW846 Metals
- pH= SW846 pH
- CN= SW846 Cyanide

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24230

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24230. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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 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 the 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**

No Qualifiers were assigned.

## DATA ASSESSMENT NARRATIVE

### SEMIVOLATILES - ORGANOTINS

#### 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, calibration results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8270, modified for organotins; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24230S

A validation was performed on the organotin data from SDGs 24230S. 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
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

#### Overall Performance

Overall performance was acceptable.

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
------------------	--------------------	-----------	-----------

NO QUALIFICATIONS WERE 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 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, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

### SDG # 24230B

A validation was performed on the Semivolatile Data from SDG 24230B. 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

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
SBLK1	diethylphthalate	50J	500

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
081CC00101	diethylphthalate	CRQL
081CC00201		

**DATA ASSESSMENT AND NARRATIVE**

**SEMIVOLATILE ANALYSIS**

**PAGE - 2**

**Rinseate Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
GDEEW19D01	bis(2-ethylhexyl)phthalate	67J	670

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
081CC00101	bis(2-ethylhexyl)phthalate	CRQL
081CC00201		
081CC00301		

**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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
081CC00101 081CC00201	diethylphthalate	+	CRQL
081CC00101 081CC00201 081CC00301	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



# HEARTLAND

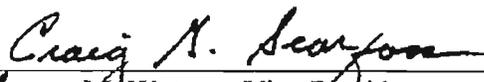
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24230  
Date: February 8, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 5 - 7, 1995  
Number of Samples: 4 Aqueous Sample(s) with 0 MS/MSD(s)  
8 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, pesticides w/PCB's, PCB's, Organotins, Metals, pH, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

3-14-96  
\_\_\_\_\_  
Date

SDG# 24230

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	PCB	ORG	TAL	pH	CN								
065EW00101	WATER	X	X	X			X		X								
081CC00101	SOIL	X	X	X		X	X		X								
081CC00201	SOIL	X	X	X		X	X		X								
081CC00301	SOIL	X	X	X		X	X		X								
526TB00201	WATER	X															
562SB00101	SOIL	X				X											
562SB00102	SOIL	X				X											
562SB00202	SOIL	X				X											
GDEW19D01	WATER	X															
GDEEW19D01	WATER	X	X	X			X		X								
562SB00201	SOIL					X											
579CC00101	SOIL					X	X	X									
Total Billable Samples (Water/Soil)		4	6	2	3	2	3	0	5	0	3	2	4	0	1	2	3

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- P/P = SW846 Pesticides/PCB's
- PCB = SW846 PCB's
- ORG = SW846 Organotins
- TAL = SW846 Metals
- pH = SW846 pH
- CN = SW846 Cyanide

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24230

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24230. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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 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 the 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

No Qualifiers were assigned.

## DATA ASSESSMENT NARRATIVE

### DIOXIN/FURANS - 8290

#### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24431

A validation was performed on the Dioxin/Furan Data from SDG 24431. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- \* • Blanks
- \* • Laboratory Control Samples
- N/A • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

#### Blanks

The method blank exhibited positive results for OCDD and OCDF at concentrations of 1.809 ng/Kg and 1.901 ng/Kg, respectively (see Table 1).

# Data Assessment Narrative

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Table 1

Congener ID	MB Conc. (ng/Kg)	170CB00801	Q	170CB00901	Q
OCDD	1.809	6.8	N	246	N
OCDF	1.901	0.935	U	16.2	N

## 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
All samples	See Table 1	+B	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

### ORGANOPHOSPHOROUS PESTICIDES

#### 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 SW-846 Method 8140; 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 # 24431A

A validation was performed on the Organophosphorous Pesticide Data from SDG 24431A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

NO QUALIFICATIONS WERE 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



# HEARTLAND

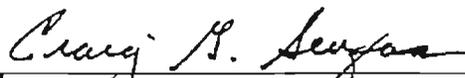
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24431B  
Date: February 28, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 3, 1996  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
19 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
Validation Guidance: Functional Guidelines for Organic and Inorganic Data, Region III  
Modifications  
QA/QC Level: EPA DQO Level III  
Method(s) Utilized: SW846 Third Edition  
Analytical Fractions: Volatiles, Semivolatiles, PCB's, Pesticides, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

3-6-95.  
\_\_\_\_\_  
Date

SDG# 24431B

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	PCB	PEST	TAL	CN						
170SB00102	SOIL	X											
170SB00802	SOIL	X											
170TB00901	WATER	X											
GDESB01601	SOIL	X	X		X	X	X						
GDESB01602	SOIL	X	X		X	X	X						
170SB00101	SOIL			X									
170SB00102	SOIL			X									
170SB00201	SOIL			X									
170SB00301	SOIL			X									
170SB00302	SOIL			X									
170SB00401	SOIL			X									
170SB00501	SOIL			X									
170SB00601	SOIL			X									
170SB00602	SOIL			X									
170SB00701	SOIL			X									
170SB00702	SOIL			X									
170SB00801	SOIL			X									
170SB00802	SOIL			X									
170SB00901	SOIL			X									
170SB00902	SOIL			X									
Total Billable Samples (Water/Soil)		1	4	0	2	0	15	0	2	0	2	0	2

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- PEST = SW846 Pesticides
- PCB = SW846 PCB's
- TAL = SW846 Metals
- CN = SW846 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 SW846, Method 8240; the National Functional Guidelines for Organic Data Review, June 1991, 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 # 24431B

A validation was performed on the Volatile Data from SDG 24431B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, R21278, 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).

170TB00901                      methylene chloride

**Rinseate Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>
525EB00601	methylene chloride chloroform	6 ug/L 3J ug/L

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
170SB00102 GDESB-1601	chloroform	CRQL
170SB00102 170SB00802 170SB00802RE GDESB01601 GDESB01601RE	methylene chloride	U
GDESB01602	methylene chloride	CRQL

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

170SB00802  
GDESB01601  
170SB00802RE  
GDESB01601RE

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries.

170SB00802RE  
GDESB01601RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
170TB00901	methylene chloride	+	J
170SB00102 GDESB-1601	chloroform	+	CRQL
170SB00102 170SB00802 170SB00802RE GDESB01601 GDESB01601RE	methylene chloride	+	U
GDESB01602	methylene chloride	+	CRQL
170SB00802 GDESB01601 170SB00802RE GDESB01601RE	All analytes	+	J
170SB00802RE GDESB01601RE	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 SW846, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

### SDG # 24431B

A validation was performed on the Semivolatile Data from SDG 24431B. 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

### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

No qualifications a 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

### CHLORINATED PESTICIDE/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24431B

A validation was performed on the Pesticide/PCB Data from SDG 24431B. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### Surrogate Recoveries

One (1) sample required qualification because of surrogate recoveries above the QC limit.

#### Specific Finding

The following sample exhibited DCB recoveries above the QC limits. All positive results in the sample are qualified as estimated, J.

170SB00901

**DATA ASSESSMENT NARRATIVE  
CHLORINATED PESTICIDE/PCBS**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance as acceptable. The reviewer estimates that less than 5% of the data required qualification/rejection.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
170SB00901	All compounds	+	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 # 24431

A validation was performed on the Metals Data from SDG 24431. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.16 mg/kg	no impact
Nickel	0.15 mg/kg	no impact
Potassium	66.0 mg/kg	no impact
Tin	2.28 mg/kg	GDESB01602.

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.

## Serial Dilution Analysis

### Specific Findings

The Serial dilution for Potassium for soil samples was outside the control limits. All positive results are qualified as estimated, "J".

### 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
GDESB01602	Sn.	+	U
all soil samples	K.	+	J
All "B" results	all analytes	B	J

# 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 # 24276

A validation was performed on the Metals Data from SDG 24276. 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.

## Serial Dilution Analysis

### Specific Finding

The Serial Dilutions for Barium, Calcium, Magnesium, Manganese and Potassium were outside the control limits. No qualification of data is necessary.

### 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

## 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 # 24276

A validation was performed on the Metals Data from SDG 24276. 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.

### Serial Dilution Analysis

#### Specific Finding

The Serial Dilutions for Barium, Calcium, Magnesium, Manganese and Potassium were outside the control limits. No qualification of data is necessary.

#### 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 Ensafé's request.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
All "B" results	all analytes	B	J

## 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, June 1991, 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 # 24276B

A validation was performed on the Volatile Data from SDG 24276B, 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

#### 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

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 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, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

### SDG # 24276B

A validation was performed on the Semivolatile Data from SDG 24276B. 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

### Compound Identification/Quantitation

#### Specific Finding:

Reject all results (R) for sample 562EB00202, in favor of the re-analyzed samples 562EB00202RE, due to 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
562EB00202	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



# HEARTLAND

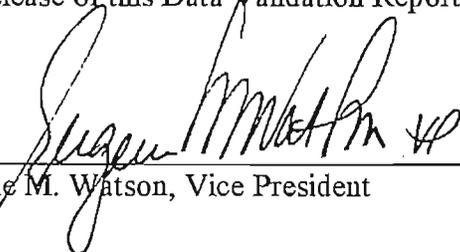
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24276  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 11, 1995  
Number of Samples: 2 Aqueous Sample(s) with 0 MS/MSD(s)  
1 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, Pesticides/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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

  
\_\_\_\_\_  
Date

SDG# 24276

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	TAL	CN				
562TB00202	WATER	X								
562EB00202	WATER	X	X	X	X	X				
171KB00101	SOIL			X						
Total Billable Samples (Water/Soil)		2	0	1	0	1	1	0	1	0

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- P/P = SW846 Pesticides/PCB's
- TAL = SW846 Metals
- CN = SW846 Cyanide

**DATA ASSESSMENT NARRATIVE**  
**CHLORINATED PESTICIDES/PCBs**

**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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24276**

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24276. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

**Surrogates**

One sample (BLK1212WE, %REC = 41) exhibited TCX with a percent recovery greater than 10% and less than the lower limit. Qualify all positive results as estimated (J) and all non-detect results as estimated (UJ).

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did require qualifications/rejections stated above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>SURROGATE</u>	<u>%REC</u>
BL1212WE	TCX-1	41%



# HEARTLAND

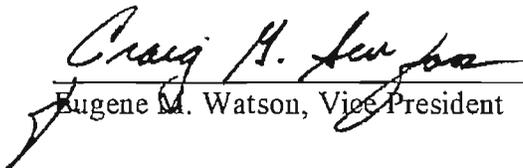
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24293A  
Date: March 19, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 12, 1995  
Number of Samples: 3 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Pesticides w/PCB's, Herbicides, Organophosphorus Pesticides, Dioxin/Furans, Hexavalent Chromium

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:

  
Eugene M. Watson, Vice President

3-19-96  
Date

SDG# 24293A

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	P/P		HERB		OPP		D/F		HCR	
171CB00801	SOIL		X		X		X		X		X
171CB01002	SOIL		X		X		X		X		X
171CB01202	SOIL		X		X		X		X		X
Total Billable Samples (Water/Soil)		0	3	0	3	0	3	0	3	0	3

P/P= SW846 Pesticides/PCB's

HERB= SW846 Herbicides

OPP= SW846 Organophosphorus Pesticides

D/F= SW846 Dioxin/Furans

HCR= SW846 Hexavalent Chromium

## **DATA ASSESSMENT NARRATIVES**

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; 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 # 24293

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24293. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
------------------	----------------	-----------	-----------

NO QUALIFICATIONS WERE 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

### CHLORINATED HERBICIDES

#### 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 8150; 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 # 24293A

A validation was performed on the Herbicide Data from SDG 24293A. 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.

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

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

## ORGANOPHOSPHORUS PESTICIDES

### 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 8140; 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 # 24293A

A validation was performed on the Organophosphorus Pesticide Data from SDG 24293A. 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.

### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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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 HEXAVALENT CHROMIUM

## 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 # 24293

A validation was performed on the Hexavalent Chromium Data from SDG 24293. The data was evaluated based on the following parameters.

- \* ● Data Completeness
- \* ● Holding Times
- \* ● Calibrations
- \* ● Blanks
- \* ● Matrix Spike Recovery
- \* ● Laboratory Control Samples

\* - 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

# DATA ASSESSMENT NARRATIVE

## DIOXIN/FURANS - 8290

### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24293

A validation was performed on the Dioxin/Furan Data from SDG 24293. The data was evaluated based on the following parameters.

- |     |   |                                      |
|-----|---|--------------------------------------|
| *   | • | Data Completeness                    |
| *   | • | Holding Times                        |
| *   | • | Mass Resolution Checks               |
| *   | • | Column Performance                   |
| *   | • | Calibrations                         |
| *   | • | Internal Standard Recovery           |
| *   | • | Blanks                               |
| N/A | • | Laboratory Control Samples           |
| *   | • | Matrix Spike/Matrix Spike Duplicate  |
| *   | • | Field Duplicates                     |
| *   | • | Congener Identification/Quantitation |

\* - All criteria were met for this parameter.

## 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
------------------	--------------------	-----------	-----------

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



# HEARTLAND

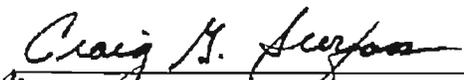
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24293B  
Date: March 19, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 12, 1995  
Number of Samples: 28 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: PCB's

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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

3-19-96  
\_\_\_\_\_  
Date

## SDG# 24293B

## Samples and Fractions Reviewed

Sample Identifications      Analytical Fractions

ENSAFE ID	MATRIX	PCB	
171SB00201	SOIL		X
171KB00201	SOIL		X
171SB00202	SOIL		X
171SB00301	SOIL		X
171SB00302	SOIL		X
171KB00401	SOIL		X
171SB00501	SOIL		X
171KB00501	SOIL		X
171SB00502	SOIL		X
171SB00601	SOIL		X
171SB00602	SOIL		X
171SB00701	SOIL		X
171KB00701	SOIL		X
171SB00702	SOIL		X
171SB00801	SOIL		X
171KB00801	SOIL		X
171SB00802	SOIL		X
171SB00901	SOIL		X
171SB01001	SOIL		X
171KB01001	SOIL		X
171SB01002	SOIL		X
171SB01101	SOIL		X
171KB01101	SOIL		X
171SB01102	SOIL		X
171SB01201	SOIL		X
171SB01202	SOIL		X
171SB01301	SOIL		X
171KB01301	SOIL		X
Total Billable Samples (Water/Soil)		0	28

PCB = SW846 PCB's

**DATA ASSESSMENT NARRATIVE**  
**CHLORINATED PESTICIDES/PCBs**

**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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24293**

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24293. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

**Surrogate Recoveries**

Three samples exhibit surrogate recoveries greater than the upper limit. Qualify all positive results as estimated.

<u>Sample ID</u>	<u>Surrogate</u>	<u>%Rec</u>
171SB00601	DCB-1	162
171SB00601	DCB-2	187
171SB01201	DCB-1	348
171SB01201	DCB-2	415
171SB01301	DCB-1	215
171SB01301	DCB-2	962

## System Performance and Overall Assessment

Overall performance was acceptable. The data did require qualifications/rejections as stated above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>DL</u>	<u>QL</u>
171SB00601	+	J
171SB01201	+	J
171SB01301	+	J

<u>SAMPLE ID</u>	<u>SURROGATE</u>	<u>%REC</u>
171SB00601	DCB-1	162
171SB00601	DCB-2	187
171SB01201	DCB-1	348
171SB01201	DCB-2	415
171SB01301	DCB-1	215
171SB01301	DCB-2	962

- \* 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.



# HEARTLAND

ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24312B  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 13, 1995  
Number of Samples: 25 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: PCB's

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*  
Eugene M. Watson, Vice President

*20 March 1996*  
Date

SDG# 24312B

**Samples and Fractions Reviewed**

Sample Identifications    Analytical Fractions

ENSAFE ID	MATRIX	PCB	
171SB01501	SOIL		X
171SB01502	SOIL		X
171SB01401	SOIL		X
171SB02402	SOIL		X
171KB02401	SOIL		X
171KB02301	SOIL		X
171SB02201	SOIL		X
171KB02201	SOIL		X
171SB02202	SOIL		X
171SB02301	SOIL		X
171SB02302	SOIL		X
171KB02101	SOIL		X
171SB02101	SOIL		X
171KB02001	SOIL		X
171SB02001	SOIL		X
171SB02002	SOIL		X
171SB02501	SOIL		X
171SB02502	SOIL		X
171KB01801	SOIL		X
171KB01701	SOIL		X
171SB01901	SOIL		X
171SB01902	SOIL		X
171KB01601	SOIL		X
171SB01601	SOIL		X
171SB01602	SOIL		X
Total Billable Samples (Water/Soil)		0	25

PCB = SW846 PCB's

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24312

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24312. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### Surrogate Recoveries

Four samples exhibit surrogate recoveries greater than the upper limit. Qualify all positive results as estimated (J). Two samples exhibit surrogate recoveries greater than 10% and less than the lower limit. Qualify all positive results as estimated (J) and all non-detects as estimated (UJ).

<u>Sample ID</u>	<u>Surrogate</u>	<u>%Rec</u>
171SB01501	DCB-1	226
171SB01501	DCB-2	193
171SB01401	DCB-1	432
171SB01401	DCB-2	398
171SB02301	TCX-1	21

<u>Sample ID</u>	<u>Surrogate</u>	<u>%Rec</u>
171SB02301	TCX-2	25
171SB02301	DCB-1	27
171SB02301	DCB-2	30
171KB02001	DCB-1	38
171KB02001	DCB-2	38
171SB02501	DCB-1	181
171SB02501	DCB-2	155
171SB01601	DCB-1	319
171SB01601	DCB-2	295

### **System Performance and Overall Assessment**

Overall performance was acceptable. The data did require qualifications/rejections as stated above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
171SB01501	ALL	+	J
171SB01401		+	J
171SB02301		+/-	J/UJ
171KB02001		+/-	J/UJ
171SB02501		+	J
171SB01601		+	J

<u>SAMPLE ID</u>	<u>SURROGATE</u>	<u>%REC</u>
171SB01501	DCB-1	226
171SB01501	DCB-2	193
171SB01401	DCB-1	432
171SB01401	DCB-2	398
171SB02301	TCX-1	21
171SB02301	TCX-2	25
171SB02301	DCB-1	27
171SB02301	DCB-2	30
171KB02001	DCB-1	38
171KB02001	DCB-2	38
171SB02501	DCB-1	181
171SB02501	DCB-2	155
171SB01601	DCB-1	319
171SB01601	DCB-2	295

- \* 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 HEXAVALENT CHROMIUM

## 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 # 24312

A validation was performed on the Hexavalent Chromium Data from SDG 24312. The data was evaluated based on the following parameters.

- \* ● Data Completeness
- \* ● Holding Times
- \* ● Calibrations
- \* ● Blanks
- \* ● Laboratory Control Samples

\* - 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

# **DATA ASSESSMENT NARRATIVE**

## **ORGANOPHOSPHORUS PESTICIDES**

### **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 8140; 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 # 24312A**

A validation was performed on the Organophosphorus Pesticide Data from SDG 24312A. 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.

### **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.

# DATA ASSESSMENT NARRATIVE

## CHLORINATED HERBICIDES

### 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 8150; 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 # 24312A

A validation was performed on the Herbicide Data from SDG 24312A. 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.

### 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

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

### CHLORINATED HERBICIDES

#### 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 8150; 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 # 24312A

A validation was performed on the Herbicide Data from SDG 24312A. 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.

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

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

### DIOXIN/FURANS - 8290

#### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24312

A validation was performed on the Dioxin/Furan Data from SDG 24312. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- \* • Blanks
- N/A • Laboratory Control Samples
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

## 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
------------------	--------------------	-----------	-----------

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



# HEARTLAND

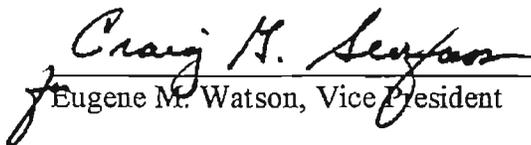
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24312  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 13, 1995  
Number of Samples: 2 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Pesticides/PCB's, Herbicides, Organophosphorus Pesticides, Dioxin, Hexavalent Chromium

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:

  
Eugene M. Watson, Vice President

3-15-96  
Date

SDG# 24312

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	P/P		HERB		OPP		DIO		HCR	
171CB01901	SOIL	X		X		X		X		X	
171CB01902	SOIL	X		X		X		X		X	
Total Billable Samples (Water/Soil)		0	2	0	2	0	2	0	2	0	2

P/P= SW846 Pesticides  
HERB= SW846 Herbicides  
DIO= SW846 Dioxins  
HCR= SW846 Hexavalent Chromium

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; 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 # 24312

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24312. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
------------------	----------------	-----------	-----------

NO QUALIFICATIONS WERE 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 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 # 24326

A validation was performed on the Metals Data from SDG 24326. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.11 mg/kg	no impact
Nickel	0.11 mg/kg	no impact
Sodium	13.4 mg/kg	all soil samples below 67.0 mg/kg
Tin	2.55 mg/kg	all soil samples below 12.8 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Potassium	-139 mg/kg	all soil samples below 1390 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 (51%) and Lead (62%) were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

### 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 Ensafé's request.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 67 mg/kg	Na.	+	U
all soil samples below 12.8 mg/kg	Sn.		
all soil samples below 1390 mg/kg	K.	+/U	J/UJ
all soil samples	Sb and Pb.	+/U	J/UJ
All "B" results	all analytes	B	J

# 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 # 24326

A validation was performed on the Metals Data from SDG 24326. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.11 mg/kg	no impact
Nickel	0.11 mg/kg	no impact
Sodium	13.4 mg/kg	all soil samples below 67.0 mg/kg
Tin	2.55 mg/kg	all soil samples below 12.8 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Potassium	-139 mg/kg	all soil samples below 1390 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 (51%) and Lead (62%) were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

#### 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 Ensafé's request.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 67 mg/kg	Na.	+	U
all soil samples below 12.8 mg/kg	Sn.		
all soil samples below 1390 mg/kg	K.	+/U	J/UJ
all soil samples	Sb and Pb.	+/U	J/UJ
All "B" results	all analytes	B	J

# 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, June 1991, 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 # 24326B

A validation was performed on the Volatile Data from SDG 24326B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, K12662, 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).

083SB00302	methylene chloride (-63.0)
083SB00802	acetone (53.4)
083SB00701	2-hexanone (53.4)
083SB00702	

The continuing calibration, K12681, 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).

083SB00301	acetone (43.3)
083SB00302RE	
083SB00801	
083SB00401	
083SB00402	
083SB00202	

The continuing calibration, K12701, 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).

083SB00401RE	acetone (51.2)
083SB00402RE	

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**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).

083SB00302	bromochloromethane
083SB00302RE	1,4-difluorobenzene chlorobenzene-d <sub>5</sub>
083SB00402	chlorobenzene-d <sub>5</sub>

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

083SB00302	toluene-d <sub>8</sub>	124
083SB00302RE	toluene-d <sub>8</sub>	132
083SB00401	toluene-d <sub>8</sub>	133
083SB00402	toluene-d <sub>8</sub>	124
083SB00401RE	toluene-d <sub>8</sub>	125
083SB00402RE	toluene-d <sub>8</sub>	130

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 4**

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant internal standard areas and/or surrogate recoveries.

083SB00302RE

083SB00402

083SB00401RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
083SB00302	methylene chloride (-63.0) acetone (53.4) 2-hexanone (53.4)	+/-	J/UJ
083SB00802			
083SB00701			
083SB00702			
083SB00301	acetone (43.3)	+/-	J
083SB00302RE			
083SB00801			
083SB00401			
083SB00402			
083SB00202			
083SB00401RE	acetone (51.2)	+/-	J/UJ
083SB00402RE			
083SB00302	All associated analytes bromochloromethane 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>	+/-	J/UJ
083SB00302RE			
083SB00402	chlorobenzene-d <sub>5</sub>		
083SB00302	All analytes	+	J
083SB00302RE			
083SB00401			
083SB00402			
083SB00401RE			
083SB00402RE			
083SB00302RE	All analytes	+/-	R
083SB00402			
083SB00401RE			

\* 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

### SEMIVOLATILES - ORGANOTINS

#### 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, calibration results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8270, modified for organotins; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24326S

A validation was performed on the organotin data from SDGs 24326S. 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
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

#### Overall Performance

Overall performance was acceptable.

## **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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
------------------	--------------------	-----------	-----------

NO QUALIFICATIONS WERE 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 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, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24326B

A validation was performed on the Semivolatile Data from SDG 24326B. 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.

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE ANALYSIS

PAGE - 2

#### Continuing calibrations (continued)

##### Specific Finding:

The continuing calibration, P5692, 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 detect as estimated (UJ).

083SB00801                      4-nitrophenol (66.7)  
083SB00201  
083SB00501

The continuing calibration, P5712, 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 detect as estimated (UJ).

083SB00502                      2,4-dinitrophenol (50.7)  
    4-nitrophenol (57.2)

#### Rinseate Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
083EB00202	diethylphthalate	7JB	2300

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
083SB00701	diethylphthalate	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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
083SB00801 083SB00201 083SB00501	4-nitrophenol (66.7)	+/-	J/UJ
083SB00502	2,4-dinitrophenol (50.7) 4-nitrophenol (57.2)	+/-	J/UJ
083SB00701	diethylphthalate	+	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



# HEARTLAND

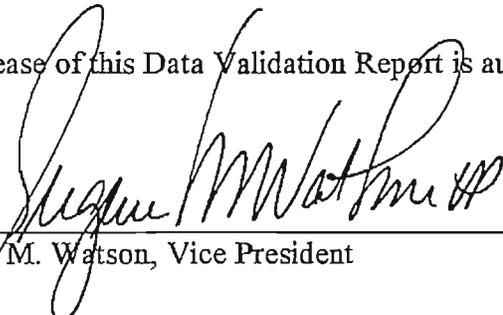
ENVIRONMENTAL SERVICES, INC.

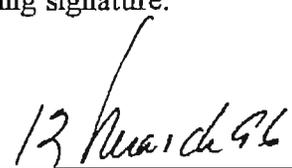
## Data Validation Report

SDG#: 24326  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 14 - 18, 1995  
Number of Samples: 4 Aqueous Sample(s) with 0 MS/MSD(s)  
12 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, Pesticides/PCB's, Organotins, Petroleum Hydrocarbons, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

  
\_\_\_\_\_  
Date

## SDG# 24326

## Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	ORG	TPH	TAL	CN							
083SB00201	SOIL	X	X	X	X		X	X							
083SB00202	SOIL	X	X	X	X		X	X							
083EB00202	WATER	X	X	X			X	X							
083DB00202	WATER	X	X	X			X	X							
083SB00301	SOIL	X	X	X	X		X	X							
083SB00302	SOIL	X	X	X	X		X	X							
083SB00401	SOIL	X	X	X	X		X	X							
083SB00402	SOIL	X	X	X	X		X	X							
083TB00402	WATER	X													
083SB00501	SOIL	X	X	X	X		X	X							
083SB00502	SOIL	X	X	X	X	X	X	X							
083TB00502	WATER	X													
083SB00701	SOIL	X	X	X	X		X	X							
083SB00702	SOIL	X	X	X	X		X	X							
083SB00801	SOIL	X	X	X	X		X	X							
083SB00802	SOIL	X	X	X	X		X	X							
Total Billable Samples (Water/Soil)		4	12	2	12	2	12	0	12	0	1	2	12	2	12

VOA = SW846 Volatiles  
 SV = SW846 Semivolatiles  
 P/P = SW846 Pesticides/PCB's  
 ORG = SW846 Organotins  
 TPH = SW846 Petroleum Hydrocarbons  
 TAL = SW846 Metals  
 CN = SW846 Cyanide

**DATA ASSESSMENT NARRATIVE**  
**CHLORINATED PESTICIDES/PCBs**

**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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24326**

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24326. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

**Surrogates**

One sample (083SB00501, %REC = 4) exhibited TCX with a percent recovery less than 10%. Qualify all positive results as estimated (J) and reject all non-detect results.

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did require qualifications/rejections stated above.

## 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 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 the 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  
083SB00501

SURROGATE  
TCX-1

%REC  
4%

# 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 # 24326

A validation was performed on the Metals Data from SDG 24326. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.11 mg/kg	no impact
Nickel	0.11 mg/kg	no impact
Sodium	13.4 mg/kg	all soil samples below 67.0 mg/kg
Tin	2.55 mg/kg	all soil samples below 12.8 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Potassium	-139 mg/kg	all soil samples below 1390 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 (51%) and Lead (62%) were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

#### 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 Ensafes request.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 67 mg/kg	Na.	+	U
all soil samples below 12.8 mg/kg	Sn.		
all soil samples below 1390 mg/kg	K.	+/U	J/UJ
all soil samples	Sb and Pb.	+/U	J/UJ
All "B" results	all analytes	B	J

# 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 # 24364

A validation was performed on the Metals Data from SDG 24364. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Aluminum	2.65 mg/kg	no impact
Chromium	0.17 mg/kg	no impact
Iron	3.12 mg/kg	no impact
Tin	2.73 mg/kg	all soil samples below 13.7 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Sodium	-13.0 mg/kg	all soil samples below 130 mg/kg

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

#### 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 13.7 mg/kg	Sn.	+	U
all soil samples below 130 mg/kg	Na.	+/U	J/UJ
All "B" results	all analytes	B	J

## 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 # 24364

A validation was performed on the Metals Data from SDG 24364. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Aluminum	2.65 mg/kg	no impact
Chromium	0.17 mg/kg	no impact
Iron	3.12 mg/kg	no impact
Tin	2.73 mg/kg	all soil samples below 13.7 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Sodium	-13.0 mg/kg	all soil samples below 130 mg/kg

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

#### 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 13.7 mg/kg	Sn.	+	U
all soil samples below 130 mg/kg	Na.	+/U	J/UJ
All "B" results	all analytes	B	J

## 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, June 1991, 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 # 24364B

A validation was performed on the Volatile Data from SDG 24364B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, K12716, 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).

525SB00102	acetone (56.5)
525SB00201	2-hexanone (51.8)
525SB00101	
525SB00301	
525SB00302	
525SB00202	

The continuing calibration, K12701, 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).

525SB00401	2-butanone (53.2)
525SB00402	

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
525SB00102	acetone (56.5)	+/-	J/UJ
525SB00201	2-hexanone (51.8)		
525SB00101			
525SB00301			
525SB00302			
525SB00202			
525SB00401	2-butanone (53.2)	+/-	J/UJ
525SB00402			

- \* 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

## TPH - EXTRACTABLES AND PURGEABLES

### 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, calibration results, surrogate and matrix spike recoveries, and GC performance. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8015, modified for extractable and purgeable TPH; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24364

A validation was performed on the TPH by GC data from SDGs 24364. 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
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

### Surrogate Recoveries

### Specific Finding

All positive results in the following samples are qualified as estimated, J, due to high surrogate recoveries.

<u>Sample</u>	<u>Surrogate</u>	<u>% Recovery</u>
083SB00601	naphthalene	195 %
083SB00602		238 %

**DATA ASSESSMENT NARRATIVE  
TPH - EXTRACTABLES AND PURGEABLES**

**PAGE 2**

**Overall Performance**

Overall performance was acceptable.

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
083SB00601 083SB00602	GASOLINE	+	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 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, June 1991, 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 # 24364B

A validation was performed on the Volatile Data from SDG 24364B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, K12716, 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).

525SB00102	acetone (56.5)
525SB00201	2-hexanone (51.8)
525SB00101	
525SB00301	
525SB00302	
525SB00202	

The continuing calibration, K12701, 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).

525SB00401	2-butanone (53.2)
525SB00402	

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
525SB00102	acetone (56.5)	+/-	J/UJ
525SB00201	2-hexanone (51.8)		
525SB00101			
525SB00301			
525SB00302			
525SB00202			
525SB00401	2-butanone (53.2)	+/-	J/UJ
525SB00402			

- \* 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, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24364B

A validation was performed on the Semivolatile Data from SDG 24364B. 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

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
SBLK1	diethylphthalate	110J	1100
	bis(2-ethylhexyl)phthalate	470J	4700

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
525SB00101	diethylphthalate	CRQL
525SB00102		
525SB00201		
525SB00202		

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Method Blanks (continued)

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
SBLK1	diethylphthalate	110J	1100
	bis(2-ethylhexyl)phthalate	470J	4700

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
525SB00301	diethylphthalate	CRQL
525SB00302		
525SB00401		
525SB00402		
083SB00602		

525SB00101	bis(2-ethylhexyl)phthalate	CRQL
525SB00102		
525SB00201		
525SB00301		
525SB00302		
525SB00402		

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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
525SB00101	diethylphthalate	+	CRQL
525SB00102			
525SB00201			
525SB00202			
525SB00301			
525SB00302			
525SB00401			
525SB00402			
083SB00602			
525SB00101	bis(2-ethylhexyl)phthalate	+	CRQL
525SB00102			
525SB00201			
525SB00301			
525SB00302			
525SB00402			

- \* 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

### SEMIVOLATILES - ORGANOTINS

#### 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, calibration results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8270, modified for organotins; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24364S

A validation was performed on the organotin data from SDGs 24364S. 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
- \*     •     Identification/Quantitation

\* - All criteria were met for this parameter.

#### Matrix Spike/Matrix Spike Duplicates

The MS/MSD pair and the LCS/LCSD pair exhibited 0% recovery for tributyltin. The laboratory noted in the case narrative that problems have developed with the recovery of this compound. Therefore, based on the lack of data supporting that the compound can be recovered in the DI water or the sample matrix, non-detect results required rejection in the samples.

**DATA ASSESSMENT NARRATIVE  
SEMIVOLATILES - ORGANOTINS**

**PAGE 2**

**Matrix Spike/Matrix Spike Duplicates, continued**

**Specific Finding**

Reported positive results required qualification as estimated, J, and non-detect results required rejection, R, due to 0% recoveries in the MS/MSD pair and LCS/LCSD pair for the compound tributyltin in all samples.

**Overall Performance**

Overall performance was not acceptable.

## 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

<u>SAMPLE_ID</u>	<u>COMPOUND_ID</u>	<u>DL</u>	<u>QL</u>
ALL SAMPLES	TRIBUTYLTIN	+/-	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



# HEARTLAND

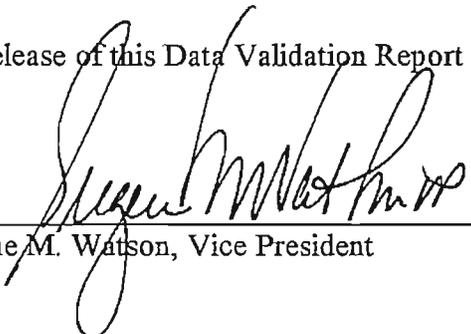
ENVIRONMENTAL SERVICES, INC.

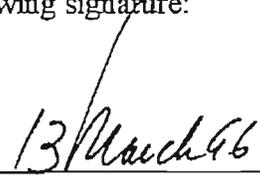
## Data Validation Report

SDG#: 24364  
Date: February 7, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: December 12, 1995  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
10 Non-aqueous Sample(s) with 3 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, pesticides/PCB's, Organotins, Petroleum Hydrocarbons, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

  
\_\_\_\_\_  
Date

SDG# 24364

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	ORG	TPH	TAL	CN							
083SB00601	SOIL	X	X	X	X	X	X	X							
083SB00602	SOIL	X	X	X	X	X	X	X							
083TB00602	WATER	X													
525SB00101	SOIL	X	X	X	X		X	X							
525SB00102	SOIL	X	X	X	X		X	X							
525SB00201	SOIL	X	X	X	X		X	X							
525SB00202	SOIL	X	X	X	X		X	X							
525SB00301	SOIL	X	X		X		X	X							
525SB00302	SOIL	X	X	X	X		X	X							
525SB00401	SOIL	X	X	X	X		X	X							
525SB00402	SOIL	X	X	X	X		X	X							
Total Billable Samples (Water/Soil)		1	10	0	10	0	9	0	10	0	2	0	10	0	10

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- P/P = SW846 Pesticides
- ORG = SW846 Organotins
- TPH = SW846 Petroleum Hydrocarbons
- TAL = SW846 Metals
- CN = SW846 Cyanide

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24364

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24364. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### Compound Quantitation

Five samples (525SB00101, 525SB00102DL, 525SB00202, 525SB00302, 525SB00401) exhibited results greater than the linear calibration range for Tech-Chlordane. No dilutions were run for these samples. Qualify results as estimated (J). Four samples (525SB00201, 525SB00201MS, 525SB00201MSD, 525SB00402) exhibited results greater than the calibration range for Tech-Chlordane. A dilution was run for each sample. Qualify extrapolated results in original sample as rejected (R). Qualify all results other than extrapolated in dilution as rejected (UR). Qualify extrapolated result in dilution as diluted (D).

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did require qualifications/rejections stated

above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
525SB00102	Tech-Chlordane	E	R
525SB00201	Tech-Chlordane	E	R
525SB00201MS	Tech-Chlordane	E	R
525SB00201MS	alpha-Chlordane	E	R
525SB00201MS	gamma-Chlordane	E	R
525SB00201MSD	Tech-Chlordane	E	R
525SB00201MSD	alpha-Chlordane	E	R
525SB00201MSD	gamma-Chlordane	E	R
525SB00402	Tech-Chlordane	E	R
525SB00101	Tech-Chlordane	E	J
525SB00102DL	Tech-Chlordane	ED	J
525SB00202	Tech-Chlordane	E	J
525SB00302	Tech-Chlordane	E	J
525SB00401	Tech-Chlordane	E	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.



# HEARTLAND

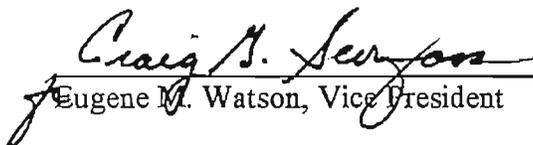
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24422  
Date: February 28, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 2, 1996  
Number of Samples: 3 Aqueous Sample(s) with 0 MS/MSD(s)  
21 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
Validation Guidance: Functional Guidelines for Organic and Inorganic Data, Region III  
Modifications  
QA/QC Level: EPA DQO Level III  
Method(s) Utilized: SW846 Third Edition  
Analytical Fractions: Volatiles, Semivolatiles, Pesticides, 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:

  
Eugene M. Watson, Vice President

3-6-96  
Date

SDG# 24422

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	PEST	PCB	TAL	CN						
525TB00601	WATER	X											
525EB00601	WATER	X	X	X		X	X						
525DB00601	WATER	X	X	X		X	X						
170M000101	SOIL				X								
170M000201	SOIL				X								
170M000301	SOIL				X								
170M000401	SOIL				X								
170KB00101	SOIL				X								
170KB00201	SOIL				X								
170KB00301	SOIL				X								
170KB00401	SOIL				X								
170KB00501	SOIL				X								
170KB00601	SOIL				X								
170KB00701	SOIL				X								
170KB00801	SOIL				X								
170KB00901	SOIL				X								
170KB01001	SOIL				X								
170KB01101	SOIL				X								
170KB01201	SOIL				X								
170KB01301	SOIL				X								
170KB01401	SOIL				X								
170KB01501	SOIL				X								
171M000101	SOIL				X								
171M000201	SOIL				X								
Total Billable Samples (Water/Soil)		3	0	2	0	2	0	21	0	2	0	2	0

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- PEST = SW846 Pesticides
- PCB = SW846 PCB's
- TAL = SW846 Metals
- CN = SW846 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 SW846, Method 8240; the National Functional Guidelines for Organic Data Review, June 1991, 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 # 24422B

A validation was performed on the Volatile Data from SDG 24422B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, R21278, 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).

525DB00601	methylene chloride
525EB00601	
525TB00601	

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
525DB00601	methylene chloride	+	J
525EB00601			
525TB00601			

- \* 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, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24422B

A validation was performed on the Semivolatile Data from SDG 24422B. 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

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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No qualifications a 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

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24422B

A validation was performed on the Pesticide/PCB Data from SDG 24422B. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### Surrogate Recoveries

One (1) sample required qualification because of surrogate recoveries above the QC limit.

#### Specific Finding

The following sample exhibited DCB recoveries above the QC limits. All positive results in the sample are qualified as estimated, J.

170M000401

**DATA ASSESSMENT NARRATIVE  
CHLORINATED PESTICIDES/PCBs**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance as acceptable. The reviewer estimates that less than 5% of the data required qualification/rejection.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
170M000401	All compounds	+	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 # 24422

A validation was performed on the Metals Data from SDG 24422. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Potassium	748 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.

### 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

## DATA ASSESSMENT NARRATIVE

### CHLORINATED HERBICIDES

#### 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 SW-846 Method 8150; 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 # 24431A

A validation was performed on the Chlorinated Herbicides from SDG 24431A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require 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

NO QUALIFICATIONS WERE 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 HEXAVALENT CHROMIUM

### 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 # 24431

A validation was performed on the Hexavalent Chromium Data from SDG 24431. The data was evaluated based on the following parameters.

- \* ● Data Completeness
- \* ● Holding Times
- \* ● Calibrations
- \* ● Blanks
- \* ● Field Duplicates
- \* ● Laboratory Control Samples

\* - All criteria were met for this parameter.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
Data stands as reported without qualification.			



# HEARTLAND

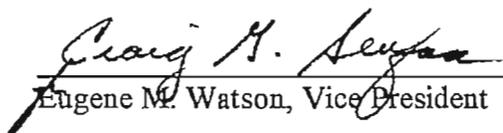
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24436A  
Date: February 28, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 4, 1996  
Number of Samples: 1 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Volatiles, Semivolatiles, Pesticides w/PCB's, Herbicides, Organophosphorus Pesticides, Hexavalent Chromium, Dioxin, 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:

  
Eugene M. Watson, Vice President

3-7-96  
Date

SDG# 24436A

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA		SV		P/P		HB		OPP		HCR		DIO		TAL		CN	
GDECB00601	SOIL	X		X		X		X		X		X		X		X		X	
Total Billable Samples (Water/Soil)		0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1

- VOA= SW846 Volatiles
- SV= SW846 Semivolatiles
- P/P= SW846 Pesticides
- HB= SW846 Herbicides
- OPP= SW846 Organophosphorus Pesticides
- HCR= SW846 Hexavalent Chromium
- DIO= SW846 Dioxins
- TAL= SW846 Metals
- CN= SW846 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 SW846, Method 8260 Appendix IX; 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 # 24436A

A validation was performed on the Volatile Data from SDG # 24436A. 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.

## DATA ASSESSMENT AND NARRATIVE

### VOLATILE ANALYSIS

PAGE - 2

#### Continuing Calibrations (continued)

##### Specific Finding:

The continuing calibration, R21309, 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).

GDECB00601	acrylonitrile
	methacrylonitrile
	methyl methacrylate
	ethyl methacrylate
	1,2-dibromoethane
	1,1,1,2-tetrachloroethane
	1,2,3-trichloropropane

The continuing calibration, R21309, 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).

GDECB00601	1,4-dichloro2-butene
	acetonitrile
	propionitrile
	isobutyl alcohol
	1,4-dioxane
	1,2-dibromo-3-chloropropane

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
GDECB00601	acrylonitrile methacrylonitrile methyl methacrylate ethyl methacrylate 1,2-dibromoethane 1,1,1,2-tetrachloroethane 1,2,3-trichloropropane	+/-	J/UJ
GDECB00601	1,4-dichloro2-butene acetonitrile propionitrile isobutyl alcohol 1,4-dioxane 1,2-dibromo-3-chloropropane	+/-	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

# 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, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

### SDG # 24436A

A validation was performed on the Semivolatile Data from SDG 24436A. 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

### 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 criteria compounds met the initial calibration criteria.

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE ANALYSIS

PAGE - 2

#### Initial calibrations (continued)

##### Specific Finding:

The initial calibration analyzed on, 01/09/96, contained compounds with %RSDs greater than 30%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

GDECB00601	benzo(b)fluoranthene indeno(1,2,3-cd)pyrene dibenz(a,h)anthracene
------------	---

#### 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.

##### Specific Finding:

The continuing calibration, A1047,-48,-49,-50,-51,-52, 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 detect as estimated (UJ).

GDECB00601	diallate kepone
------------	--------------------

The continuing calibration, A1047,-48,-49,-50,-51,-52, 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).

GDECB00601	1,3,5-trinitrobenzene 4-nitroquinoline-1-oxide
------------	---

**DATA ASSESSMENT AND NARRATIVE**

**SEMIVOLATILE ANALYSIS**

**PAGE - 3**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, A1047,-48,-49,-50,-51,-52, 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).

GDECB00601	methylpyrilene aramite
------------	---------------------------

**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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
GDECB00601	benzo(b)fluoranthene indeno(1,2,3-cd)pyrene dibenz(a,h)anthracene	+	J
GDECB00601	diallate kepone	+/-	J/UJ
GDECB00601	1,3,5-trinitrobenzene 4-nitroquinoline-1-oxide	+/-	J/R
GDECB00601	methylpyrilene aramite	+/-	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

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; 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 # 24436A

A validation was performed on the Pesticide/PCB Data from SDG 24436A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance as acceptable. The data did not require qualifications/rejections.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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

## CHLORINATED HERBICIDES

### 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 SW-846 Method 8150; 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 # 24436A

A validation was performed on the Chlorinated Herbicides from SDG 24436A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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

## ORGANOPHOSPHOROUS PESTICIDES

### 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 SW-846 Method 8140; 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 # 24436A

A validation was performed on the Organophosphorous Pesticide Data from SDG 24436A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

**DATA ASSESSMENT NARRATIVE  
ORGANOPHOSPHOROUS PESTICIDES**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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 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 # 24436

A validation was performed on the Metals Data from SDG 24436. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.12 mg/kg	no impact
Manganese	0.31 mg/kg	no impact
Nickel	0.46 mg/kg	no impact
Tin	2.48 mg/kg	all soil samples

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 Potassium(-13.1 mg/kg) but had no impact on the data.

#### 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	Sn.	+	U
All "B" results	all analytes	B	J

## DATA ASSESSMENT NARRATIVE

### DIOXIN/FURANS - 8290

#### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24436

A validation was performed on the Dioxin/Furan Data from SDG 24436. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- \* • Blanks
- \* • Laboratory Control Samples
- N/A • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

#### Blanks

The method blank exhibited positive results for OCDD, 1,2,3,4,6,7,8-HpCDF, and OCDF at concentrations of 1.83 ng/Kg, 1.86 ng/Kg and 2.6 ng/Kg, respectively (see Table 1).

## Data Assessment Narrative

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Table 1

Congener ID	MB Conc. (pg/L)	GDECB00601	Q
OCDD	1.83		
1,2,3,4,6,7,8-HpCDF	1.86	2.02	U
OCDF	2.6	2.36	U

## 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

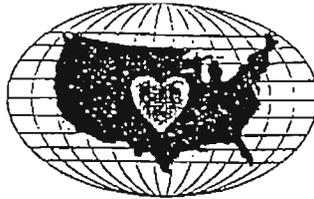
### METHOD BLANK QUALIFICATION CODES

- 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
All samples	See Table 1	+B	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



# HEARTLAND

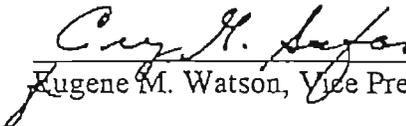
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24436B  
Date: February 28, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 4, 1996  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
14 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, PCB's, Pesticides, Diesel Range Organics, Gasoline Range Organics, 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:

  
Eugene M. Watson, Vice President

3-7-96  
Date

SDG# 24436B

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	PCB	PEST	DIE	GAS	TAL	CN
170SB01101	SOIL	X		X					
170SB01102	SOIL	X		X					
170SB01202	SOIL	X		X		X	X		
170SB01301	SOIL	X		X					
170SB01401	SOIL	X		X					
170SB01402	SOIL	X		X					
170SB01501	SOIL	X		X					
590SB00101	SOIL	X	X			X	X	X	
590TB00101	WATER	X							
590SB00102	SOIL	X	X			X	X	X	
GDESB00601	SOIL	X	X		X			X	X
GDESB00602	SOIL	X	X		X	X	X	X	X
170SB01001	SOIL			X					
170SB01201	SOIL			X					
170SB01302	SOIL			X					
Total Billable Samples (Water/Soil)		1 11	0 4	0 10	0 2	0 4	0 4	0 4	0 2

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- PCB = SW846 PCB's
- PEST = SW846 Pesticides
- DIE = SW846 Diesel Range Organics
- GAS = SW846 Gasoline Range Organics
- TAL = SW846 Metals
- CN = SW846 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 SW846, Method 8240; the National Functional Guidelines for Organic Data Review, June 1991, 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 # 24436B

A validation was performed on the Volatile Data from SDG 24436B, 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.

DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 2

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, C19171, 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).

170SB01101	methylene chloride
170SB01102	
170SB01402	
170SB01501	
590SB00101	
590SB00102	

The continuing calibration, C19171, 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).

170SB01101	vinyl acetate
170SB01102	
170SB01402	
170SB01501	
590SB00101	
590SB00102	

The continuing calibration, C19201, 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).

GDESB00602RE	acetone
170SB01202	methylene chloride
170SB01401DL	
170SB01202RE	

DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 3

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, R21332, 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).

170SB01301	methylene chloride
GDESB00601	

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).

170SB01501	bromochloromethane
590SB00101	1,4-difluorobenzene
590SB00102	chlorobenzene-d <sub>5</sub>
170SB01101RE	
170SB01402RE	
590SB00101RE	
590SB00102RE	
GEDSB00602	
GEDSB00602RE	
170SB01202RE	

170SB01101	1,4-difluorobenzene
170SB01102	chlorobenzene-d <sub>5</sub>
170SB01402	
170SB01102RE	
170SB01501DL	
170SB01202	
170SB01401DL	

170SB01401	chlorobenzene-d <sub>5</sub>
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DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 4

Rinseate Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>
525EB00601	methylene chloride chloroform	6 ug/L 3J ug/L

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
170SB01101 170SB01101RE 170SB01401 170SB01501 GDESB00602 GDESB00602RE	chloroform	CRQL

170SB01101 170SB01101RE 170SB01102 170SB01102RE 170SB01202 170SB01202RE 170SB01401 170SB01402 170SB01402RE 170SB01501 590SB00101 590SB00101RE 590SB00102 GDESB00602 GDESB00602RE	methylene chloride	U
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590SB00102RE	methylene chloride	CRQL
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DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 5

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

170SB01101  
170SB01402  
170SB01501  
590SB00101  
590SB00102  
170SB01102RE  
170SB01402RE  
590SB00101RE

The samples listed below, exhibited surrogate recoveries that were less than the QA/QC limits. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

170SB01101RE  
170SB01202RE

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries.

170SB01101RE  
170SB01102RE  
170SB01402RE  
170SB01202RE  
590SB00101RE  
590SB00102RE  
GDESB00602RE

DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 6

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
170SB01101 170SB01102 170SB01402 170SB01501 590SB00101 590SB00102	methylene chloride	+	J
170SB01101 170SB01102 170SB01402 170SB01501 590SB00101 590SB00102	vinyl acetate	+/-	J/UJ
GDESB00602RE 170SB01202 170SB01401DL 170SB01202RE	acetone methylene chloride	+	J
170SB01301 GDESB00601	methylene chloride	+	J
170SB01501 590SB00101 590SB00102 170SB01101RE 170SB01402RE 590SB00101RE 590SB00102RE GEDSB00602 GEDSB00602RE 170SB01202RE	All associated analytes bromochloromethane 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>	+/-	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

## SUMMARY OF DATA QUALIFICATIONS

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<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
170SB01101 170SB01102 170SB01402 170SB01102RE 170SB01501DL 170SB01202 170SB01401DL	All associated analytes 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>		+/- J/UJ
170SB01401	chlorobenzene-d <sub>5</sub>		
170SB01101 170SB01101RE 170SB01401 170SB01501 GDESB00602 GDESB00602RE	chloroform	+	CRQL
170SB01101 170SB01101RE 170SB01102 170SB01102RE 170SB01202 170SB01202RE 170SB01401 170SB01402 170SB01402RE 170SB01501 590SB00101 590SB00101RE 590SB00102 GDESB00602 GDESB00602RE	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

Page - 3

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
590SB00102RE	methylene chloride	+	CRQL
170SB01101 170SB01402 170SB01501 590SB00101 590SB00102 170SB01102RE 170SB01402RE 590SB00101RE	All analytes	+	J
170SB01101RE 170SB01202RE	All analytes	+/-	J/UJ
170SB01101RE 170SB01102RE 170SB01402RE 170SB01202RE 590SB00101RE 590SB00102RE GDESB00602RE	All analytes	+/-	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

## 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, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24436B

A validation was performed on the Semivolatile Data from SDG 24436B. 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

#### 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

<u>SAMPLE_ID</u>	<u>ANALYTE_ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

No qualifications a 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

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24436B

A validation was performed on the Pesticide/PCB Data from SDG 24436B. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### Surrogate Recoveries

One (1) sample required qualification because of surrogate recoveries above the QC limit.

#### Specific Finding

The following sample exhibited DCB recoveries above the QC limits. All positive results in the sample are qualified as estimated, J.

170SB01501

DATA ASSESSMENT NARRATIVE  
CHLORINATED PESTICIDES/PCBs

PAGE - 2

**System Performance and Overall Assessment**

Overall performance as acceptable. The reviewer estimates that less than 5% of the data required qualification/rejection.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
170SB01501	All compounds	+	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

## FUELS - GRO/DRO

### 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, calibration results, matrix spike recoveries and GC performance. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8015; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24436

A validation was performed on the GRO/DRO from SDGs 24436. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Column Performance
- \* • Calibrations
- \* • Blanks
- Surrogates
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Identification/Quantitation

\* - All criteria were met for this parameter.

### Surrogates

#### Specific findings:

The gasoline range surrogates exhibited non compliant low percent recoveries for all samples except 590SB00101. Qualify positive and non detect results as estimated (J/UJ). The naphthalene percent recoveries were as follows: 170SB01202 (58%), GDESB00602 (22%), and 590SB00102 (64%)

### Overall Performance

Overall performance was acceptable. The data did not require 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
All samples except 590SB00101	all compounds - gas range	+/-	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 METALS, HEXAVALENT CHROMIUM 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 # 24436

A validation was performed on the Metals Data from SDG 24436. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.12 mg/kg	no impact
Manganese	0.31 mg/kg	no impact
Nickel	0.46 mg/kg	no impact
Tin	2.48 mg/kg	all soil samples

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 potassium(-13.1 mg/kg) but had no impact on the data.

## Matrix Spike Recovery

### Specific Finding

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

The Matrix Spike recovery for Antimony was below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recoveries for Zinc and Lead were above the upper control limits. All positive results are qualified as estimated, "J".

## 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 less than 35% and will not be qualified. The field duplicate analysis for Iron was greater than 50%. All positive results are qualified as estimated, "J".

## Serial Dilution

### Specific Finding

The Serial dilution for potassium was outside the control limits. All positive results are qualified as estimated, "J".

### 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	Sn.	+	U
All soil samples	Hg.	+	J
		U	R
All soil samples	Sb.	+/U	J/UJ
All soil samples	Pb and Zn.	+	J
All soil samples	Ca and Pb.	+	J
all soil samples	K.	+	J
All "B" results	all analytes	B	J



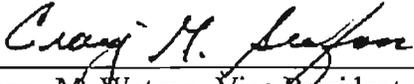
**HEARTLAND**  
ENVIRONMENTAL SERVICES, INC.

**Data Validation Report**

SDG#: 24445  
Date: February 28, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 5, 1996  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
9 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, Petroleum Hydrocarbons, Gasoline Range Organics, Metals

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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

3-7-96  
\_\_\_\_\_  
Date

SDG# 24445

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	TPH	GAS	TAL					
590SB00201	SOIL	X	X			X					
590SB00202	SOIL	X	X			X					
590SB00301	SOIL	X	X			X					
590SB00302	SOIL	X	X	X	X	X					
590SB00401	SOIL	X	X			X					
590SB00402	SOIL	X	X	X	X	X					
590SB00501	SOIL	X	X			X					
590TB00501	WATER	X									
590SB00502	SOIL	X	X	X	X	X					
590M000101	SOIL	X	X			X					
Total Billable Samples (Water/Soil)		1	9	0	9	0	3	0	3	0	9

VOA = SW846 Volatiles

SV = SW846 Semivolatiles

TPH = SW846 Petroleum Hydrocarbons

GAS = SW846 Gasoline Range Organics

TAL = SW846 Metals

## **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, June 1991, 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 # 24445B

A validation was performed on the Volatile Data from SDG 24445B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, K12796, 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).

590SB00201	methylene chloride
590SB00202	
590SB00302	
590SB00402	
590SB00501	
590SB00502	

The continuing calibration, K12796, 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).

590SB00201	vinyl acetate
590SB00202	
590SB00302	
590SB00402	
590SB00501	
590SB00502	

**Method Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>
VBLK3	chloroform	3J ug/L
<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
590SB00301	chloroform	CRQL
590SB00401		
590SB00501MS		
590SB00501MSD		
590MO00101		

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**Rinseate Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Concentration</u>
525EB00601	methylene chloride chloroform	6 ug/L 3J ug/L

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
590SB00201 590SB00202 590SB00301 170SB00501	methylene chloride	CRQL
170SB00401 170SB00501MS 170SB00501MSD 590MO00101	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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
590SB00201 590SB00202 590SB00302 590SB00402 590SB00501 590SB00502	methylene chloride	+	J
590SB00201 590SB00202 590SB00302 590SB00402 590SB00501 590SB00502	vinyl acetate	+/-	J/UJ
590SB00301 590SB00401 590SB00501MS 590SB00501MSD 590MO00101	chloroform	+	CRQL
590SB00201 590SB00202 590SB00301 170SB00501	methylene chloride	+	CRQL
170SB00401 170SB00501MS 170SB00501MSD 590MO00101 170SB00501	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

## 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, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

### SDG # 24445B

A validation was performed on the Semivolatile Data from SDG 24445B. 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

### 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

No qualifications a 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

## FUELS - GRO/DRO

### 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, calibration results, matrix spike recoveries and GC performance. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8015; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24445

A validation was performed on the GRO/DRO from SDGs 24445. The data was evaluated based on the following parameters.

- \*     •     Data Completeness
- \*     •     Holding Times
- \*     •     Column Performance
- \*     •     Calibrations
- \*     •     Blanks
- Surrogates
- \*     •     Matrix Spike/Matrix Spike Duplicate
- \*     •     Field Duplicates
- \*     •     Identification/Quantitation

\* - All criteria were met for this parameter.

### Surrogates

#### Specific findings:

The gasoline range surrogates exhibited non compliant low percent recoveries for all samples. Qualify positive and non detect results as estimated (J/UJ). The naphthalene percent recoveries were as follows: 590SB00502 (65%), 590SB00302 (57%), and 590SB00402 (64%)

### Overall Performance

Overall performance was acceptable. The data did not require 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
All samples	all compounds - gas range	+/-	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 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 # 24445

A validation was performed on the Metals Data from SDG 24445. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.12 mg/kg	no impact
Manganese	0.31 mg/kg	no impact
Nickel	0.46 mg/kg	no impact
Tin	2.48 mg/kg	all soil samples

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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Potassium	-13.1 mg/kg	no impact

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

#### 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	Sn.	+	U
All "B" results	all analytes	B	J

## DATA ASSESSMENT NARRATIVE HEXAVALENT CHROMIUM

### 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 # 24456

A validation was performed on the Hexavalent Chromium Data from SDG 24456. The data was evaluated based on the following parameters.

- \* ● Data Completeness
- \* ● Holding Times
- \* ● Calibrations
- \* ● Blanks
- \* ● Field Duplicates
- \* ● Laboratory Control Samples

\* - All criteria were met for this parameter.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
Data stands as reported without qualification.			

# 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 # 24456

A validation was performed on the Metals Data from SDG 24456. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Iron	33.7 ug/l	no impact
Zinc	4.01 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.

### 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

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24456B

A validation was performed on the Pesticide/PCB Data from SDG 24456B. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance as acceptable. The data did not require qualification/rejection.

## **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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

NO QUALIFICATIONS WERE 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



# HEARTLAND

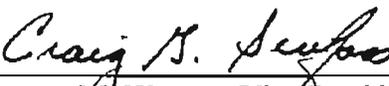
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24456A  
Date: March 11, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 8, 1996  
Number of Samples: 3 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: PCB's, Herbicides, Organophosphorus Pesticides, Dioxins, Hexavalent Chromium

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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

3-19-96.  
\_\_\_\_\_  
Date

SDG# 24456A

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	PCB		HB		OPP		DIO		HCR	
602CB00101	SOIL		X		X		X		X		X
602CB00301	SOIL		X		X		X		X		X
602CB00401	SOIL		X		X		X		X		X
Total Billable Samples (Water/Soil)		0	3	0	3	0	3	0	3	0	3

PCB = SW846 PCB's

HB = SW846 Herbicides

OPP = SW846 Organophosphorus Pesticides

DIO = SW846 Dioxin

HCR = SW846 Hexavalent Chromium

## **DATA ASSESSMENT NARRATIVES**

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; 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 # 24456A

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24456A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance as acceptable. The data did not require qualifications/rejections.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

NO QUALIFICATIONS WERE 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

### CHLORINATED HERBICIDES

#### 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 SW-846 Method 8150; 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 # 24456A

A validation was performed on the Chlorinated Herbicides from SDG 24456A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

NO QUALIFICATIONS WERE 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

## ORGANOPHOSPHOROUS PESTICIDES

### 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 SW-846 Method 8140; 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 # 24456A

A validation was performed on the Organophosphorous Pesticide Data from SDG 24456A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

**DATA ASSESSMENT NARRATIVE  
ORGANOPHOSPHOROUS PESTICIDES**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did not require qualifications/rejections.

## **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

NO QUALIFICATIONS WERE 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 HEXAVALENT CHROMIUM

### 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 # 24456

A validation was performed on the Hexavalent Chromium Data from SDG 24456. The data was evaluated based on the following parameters.

- \* ● Data Completeness
- \* ● Holding Times
- \* ● Calibrations
- \* ● Blanks
- \* ● Field Duplicates
- \* ● Laboratory Control Samples

\* - All criteria were met for this parameter.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
Data stands as reported without qualification.			

## DATA ASSESSMENT NARRATIVE

### DIOXIN/FURANS - 8290

#### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24456

A validation was performed on the Dioxin/Furan Data from SDG 24456. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- Blanks
- \* • Laboratory Control Samples
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

#### Blanks

Congener ID	MB Conc. (pg/L)	602CB00101	Q	602CB00301	Q	602CB00301	Q
OCDD	1.83	42	NA	61.8	NA	159	NA
1,2,3,4,6,7, 8-HpCDF	1.86	3.38	NA	2.02	NA	4.09	NA
OCDF	2.6	5.83	NA	3.18	NA	8.15	NA

## 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
All samples	OCDD 1,2,3,4,6,7,8-HpCDF OCDF	+B	NA

- \* 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



# HEARTLAND

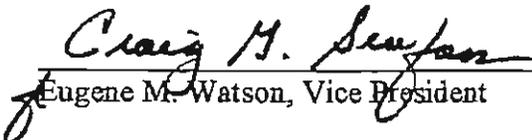
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24456B  
Date: March 11, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 8, 1996  
Number of Samples: 3 Aqueous Sample(s) with 0 MS/MSD(s)  
14 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, Pesticides w/PCB's, 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:

  
Eugene M. Watson, Vice President

3-19-96  
Date

SDG# 24456B

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	PCB	TAL	CN					
590EB00501	WATER	X	X	X		X	X					
590DB00501	WATER	X	X	X		X	X					
602TB00301	WATER	X										
602SB00402	SOIL	X			X							
604SB00301	SOIL	X			X							
604SB00302	SOIL	X			X							
GDESB00701	SOIL	X	X	X		X	X					
GDESB00702	SOIL	X	X	X		X	X					
602SB00101	SOIL				X							
602SB00102	SOIL				X							
602SB00401	SOIL				X							
604SB00101	SOIL				X							
604SB00102	SOIL				X							
604SB00201	SOIL				X							
602SB00301	SOIL				X							
602SB00302	SOIL				X							
604SB00202	SOIL											
Total Billable Samples (Water/Soil)		3	5	2	2	2	0	11	2	2	2	2

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiles
- P/P = SW846 Pesticides w/PCB's
- PCB = SW846 PCB's
- TAL = SW846 Metals
- CN = SW846 Cyanide

# 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, June 1991, 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 # 24456B

A validation was performed on the Volatile Data from SDG 24456B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, C19221, 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).

604SB00301	acetone
604SB00302	methylene chloride
604SB00701	
GDESB00702	
602SB00402	
604SB00701RE	
GDESB00702RE	
602SB00402RE	
604SB00301RE	

**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).

604SB00301	bromochloromethane
604SB00701	1,4-difluorobenzene
GDESB00702	chlorobenzene-d <sub>5</sub>
GDESB00702RE	
602SB00402RE	
604SB00701RE	
602SB00402	1,4-difluorobenzene
604SB00301RE	chlorobenzene-d <sub>5</sub>

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**Method Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
VBLK2	methylene chloride	1J	10

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
604SB00301	chloroform	CRQL
604SB00302		
602SB00402		
604SB00301RE		
602SB00402RE		
GDESB00702		
GDESB00702RE		

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit.  
Qualify all positive results as estimated (J)

604SB00301	bromofluorobenzene	141
GDESB00702	bromofluorobenzene	132
602SB00402	bromofluorobenzene	141
602SB00402RE	bromofluorobenzene	141
GDESB00701	1,2-dichloroethane-d <sub>4</sub>	154
GDESB00702RE	1,2-dichloroethane-d <sub>4</sub>	143
GDESB00701RE	bromofluorobenzene	123
	1,2-dichloroethane-d <sub>4</sub>	132

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 4**

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

602SB00402RE  
GDESB00701RE  
GDESB00702RE  
604SB00301

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
604SB00301	acetone	+	J
604SB00302	methylene chloride		
604SB00701			
GDESB00702			
602SB00402			
604SB00701RE			
GDESB00702RE			
602SB00402RE			
604SB00301RE			
	All associated analytes	+/-	J/UJ
604SB00301	bromochloromethane		
604SB00701	1,4-difluorobenzene		
GDESB00702	chlorobenzene-d <sub>5</sub>		
GDESB00702RE			
602SB00402RE			
604SB00701RE			
602SB00402	1,4-difluorobenzene		
604SB00301RE	chlorobenzene-d <sub>5</sub>		
604SB00301	chloroform	+	CRQL
604SB00302			
602SB00402			
604SB00301RE			
602SB00402RE			
GDESB00702			
GDESB00702RE			

- \* 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

Page - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
604SB00301 GDESB00702 602SB00402 602SB00402RE GDESB00701 GDESB00702RE GDESB00701RE	All analytes	+	J
602SB00402RE GDESB00701RE GDESB00702RE 604SB00301	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



# HEARTLAND

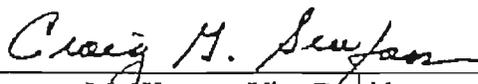
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24456B  
Date: March 11, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 8, 1996  
Number of Samples: 3 Aqueous Sample(s) with 0 MS/MSD(s)  
14 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, Pesticides w/PCB's, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

3-19-96  
\_\_\_\_\_  
Date

SDG# 24456B

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	PCB	TAL	CN					
590EB00501	WATER	X	X	X		X	X					
590DB00501	WATER	X	X	X		X	X					
602TB00301	WATER	X										
602SB00402	SOIL	X			X							
604SB00301	SOIL	X			X							
604SB00302	SOIL	X			X							
GDES00701	SOIL	X	X	X		X	X					
GDES00702	SOIL	X	X	X		X	X					
602SB00101	SOIL				X							
602SB00102	SOIL				X							
602SB00401	SOIL				X							
604SB00101	SOIL				X							
604SB00102	SOIL				X							
604SB00201	SOIL				X							
602SB00301	SOIL				X							
602SB00302	SOIL				X							
604SB00202	SOIL											
Total Billable Samples (Water/Soil)		3	5	2	2	2	0	11	2	2	2	2

- VOA= SW846 Volatiles
- SV= SW846 Semivolatiles
- P/P= SW846 Pesticides w/PCB's
- PCB= SW846 PCB's
- TAL= SW846 Metals
- CN= SW846 Cyanide

## 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, June 1991, 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 # 24456B

A validation was performed on the Volatile Data from SDG 24456B, 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.

DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 2

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, C19221, 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).

604SB00301	acetone
604SB00302	methylene chloride
604SB00701	
GDESB00702	
602SB00402	
604SB00701RE	
GDESB00702RE	
602SB00402RE	
604SB00301RE	

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).

604SB00301	bromochloromethane
604SB00701	1,4-difluorobenzene
GDESB00702	chlorobenzene-d <sub>5</sub>
GDESB00702RE	
602SB00402RE	
604SB00701RE	
602SB00402	1,4-difluorobenzene
604SB00301RE	chlorobenzene-d <sub>5</sub>

DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 3

Method Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
VBLK2	methylene chloride	1J	10

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
604SB00301	chloroform	CRQL
604SB00302		
602SB00402		
604SB00301RE		
602SB00402RE		
GDESB00702		
GDESB00702RE		

Surrogates

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

Specific Finding:

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit.  
Qualify all positive results as estimated (J)

604SB00301	bromofluorobenzene	141
GDESB00702	bromofluorobenzene	132
602SB00402	bromofluorobenzene	141
602SB00402RE	bromofluorobenzene	141
GDESB00701	1,2-dichloroethane-d <sub>4</sub>	154
GDESB00702RE	1,2-dichloroethane-d <sub>4</sub>	143
GDESB00701RE	bromofluorobenzene	123
	1,2-dichloroethane-d <sub>4</sub>	132

DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS

PAGE - 4

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

602SB00402RE  
GDESB00701RE  
GDESB00702RE  
604SB00301

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
604SB00301	acetone	+	J
604SB00302	methylene chloride		
604SB00701			
GDESB00702			
602SB00402			
604SB00701RE			
GDESB00702RE			
602SB00402RE			
604SB00301RE			
	All associated analytes	+/-	J/UJ
604SB00301	bromochloromethane		
604SB00701	1,4-difluorobenzene		
GDESB00702	chlorobenzene-d <sub>5</sub>		
GDESB00702RE			
602SB00402RE			
604SB00701RE			
602SB00402	1,4-difluorobenzene		
604SB00301RE	chlorobenzene-d <sub>5</sub>		
604SB00301	chloroform	+	CRQL
604SB00302			
602SB00402			
604SB00301RE			
602SB00402RE			
GDESB00702			
GDESB00702RE			

- \* 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

Page - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
604SB00301 GDESB00702 602SB00402 602SB00402RE GDESB00701 GDESB00702RE GDESB00701RE	All analytes	+	J
602SB00402RE GDESB00701RE GDESB00702RE 604SB00301	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 SW846, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

### SDG # 24456B

A validation was performed on the Semivolatile Data from SDG 24456B. 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

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
SBLK2	bis(2-ethylhexyl)phthalate	91J	910
<u>Samples</u>	<u>Compound</u>		<u>Qualification</u>
GDESB00701	bis(2-ethylhexyl)phthalate		CRQL

## **DATA ASSESSMENT AND NARRATIVE**

### **SEMIVOLATILE ANALYSIS**

**PAGE - 2**

#### **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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
GDESB00701	bis(2-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 SW846, Method 8270; 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 # 24464A

A validation was performed on the Semivolatile Data from SDG 24464A. 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.

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE ANALYSIS

PAGE - 2

#### Continuing calibrations (continued)

##### Specific Finding:

The continuing calibration, A1223,-24,-25,-26,-27,-28,-30, 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 detect as estimated (UJ).

530CB00102	1-naphthylamine (57.7)
	diallate (56.8)
	isodrin (64.9)
	2-naphthylamine (60.2)
	1,3-dinitrobenzene (52.7)
	3,3'-dimethylbenzidine (66.4)
	m-cresol (63.0)
	hexachloropropene (60.9)
	parathion (55.4)
	p-phenylenediamine (69.4)

The continuing calibration, A1223,-24,-25,-26,-27,-28,-30, 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).

530CB00102	methapyrilene (72.5)
	4-nitroquinoline-1-oxide (66.0)
	hexachlorophene (67.0)

#### 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

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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
530CB00102	1-naphthylamine (57.7) diallate (56.8) isodrin (64.9) 2-naphthylamine (60.2) 1,3-dinitrobenzene (52.7) 3,3'-dimethylbenzidine (66.4) m-cresol (63.0) hexachloropropene (60.9) parathion (55.4) p-phenylenediamine (69.4)	+/-	J/UJ
530CB00102	methapyrilene (72.5) 4-nitroquinoline-1-oxide (66.0) hexachlorophene (67.0)	+/-	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

# DATA ASSESSMENT NARRATIVE

## TPH - EXTRACTABLES AND PURGEABLES

### 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, calibration results, surrogate and matrix spike recoveries, and GC performance. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8015, modified for extractable and purgeable TPH; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level III requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24464

A validation was performed on the TPH by GC data from SDGs 24464. 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
- \*     •     Identification/Quantitation

\* - All criteria were met for this parameter.

### Overall Performance

Overall performance was acceptable.

001  
~~044~~

## 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

<u>SAMPLE ID</u>	<u>COMPOUND ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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

## CHLORINATED PESTICIDES/PCBs

### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24464B

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24464B. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

### Surrogate Recoveries

One (1) sample required qualification because of surrogate recoveries below the QC limit.

### Specific Finding

The following sample exhibited a TCMX and DCB recoveries below the QC limits but above 10%. All positive and non-detect results in the sample are qualified as estimated, J/UJ.

604SB00401

**DATA ASSESSMENT NARRATIVE  
CHLORINATED PESTICIDES/PCBs**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance as acceptable. The data reviewer estimates that 5% of data required qualifications/rejections.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
604SB00401	All compounds	+/-	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 SW846, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24464B

A validation was performed on the Semivolatile Data from SDG 24464B. 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.

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, T15514, 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).

530SB00101	indeno(1,2,3-cd)pyrene (27.8)
530SB00102	dibenz(a,h)anthracene (27.2)
530SB00401	benzo(g,h,i)perylene (26.5)

The continuing calibration, T15514, 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 detect as estimated (UJ).

530SB00101	diethylphthalate (58.2)
530SB00102	
530SB00501	
530SB00502	
530SB00401	
530SB00402	
530SB00301	

Method Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
SBLK1	bis(2-ethylhexyl)phthalate	90J	900

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
530SB00101	bis(2-ethylhexyl)phthalate	CRQL
530SB00102		
530SB00501		
530SB00502		
530SB00401		
530SB00402		
530SB00301		
530SB00302		
530SB00202		

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
530SB00101	indeno(1,2,3-cd)pyrene (27.8) dibenz(a,h)anthracene (27.2) benzo(g,h,i)perylene (26.5)	+	J
530SB00102			
530SB00401			
530SB00101	diethylphthalate (58.2)	+/-	J/UJ
530SB00102			
530SB00501			
530SB00502			
530SB00401			
530SB00402			
530SB00301			
530SB00101	bis(2-ethylhexyl)phthalate	+	CRQL
530SB00102			
530SB00501			
530SB00502			
530SB00401			
530SB00402			
530SB00301			
530SB00302			
530SB00202			

- \* 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



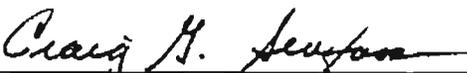
**HEARTLAND**  
ENVIRONMENTAL SERVICES, INC.

**Data Validation Report**

SDG#: 24464B  
Date: March 13, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 9, 1996  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
14 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest laboratory of Oklahoma  
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, PCB's, Gasoline Range Organics, Diesel Petroleum Hydrocarbons, Metals

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:

  
Eugene M. Watson, Vice President

3-19-96  
Date

SDG# 24464B

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	PCB	GAS	DIE	TAL						
530SB00101	SOIL	X	X				X						
530SB00102	SOIL	X	X				X						
530SB00201	SOIL	X	X				X						
530TB00201	WATER	X											
530SB00202	SOIL	X	X				X						
530SB00301	SOIL	X	X				X						
530SB00302	SOIL	X	X				X						
530SB00401	SOIL	X	X				X						
530SB00402	SOIL	X	X				X						
530SB00501	SOIL	X	X				X						
530SB00502	SOIL	X	X				X						
602SB00201	SOIL			X									
602SB00202	SOIL			X									
604SB00401	SOIL			X	X	X							
604SB00402	SOIL			X	X	X							
Total Billable Samples (Water/Soil)		1	10	0	10	0	4	0	2	0	2	0	10

- VOA= SW846 Volatiles
- SV= SW846 Semivolatiles
- PCB= SW846 PCB
- GAS= SW846 Gasoline Range Organics
- DIE= SW846 Diesel Petroleum Hydrocarbons
- TAL= SW846 Metals

## 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, June 1991, 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 # 24464B

A validation was performed on the Volatile Data from SDG 24464B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, C19225, 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).

530SB00101	2-chloroethyl vinyl ether
530SB00102	
530SB00502	
530SB00401	
530SB00402	
530SB00302	
530SB00201	

The continuing calibration, C19240, 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).

530SB00101RE	acetone
530SB00401RE	
530SB00402RE	
530SB00202	
530SB00501	

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**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).

530SB00101	bromochloromethane
530SB00402	1,4-difluorobenzene
530SB00101RE	chlorobenzene-d <sub>5</sub>
530SB00401RE	
530SB00402RE	
530SB00401	chlorobenzene-d <sub>5</sub>

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit and the were less than the QA/QC limits. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

530SB00101	bromofluorobenzene	121
	1,2-dichloroethane-d <sub>4</sub>	65
530SB00101RE	1,2-dichloroethane-d <sub>4</sub>	67

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 4**

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

530SB00101  
530SB00401RE  
530SB00402RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
530SB00101 530SB00102 530SB00502 530SB00401 530SB00402 530SB00302 530SB00201	2-chloroethyl vinyl ether	+/-	J/UJ
530SB00101RE 530SB00401RE 530SB00402RE 530SB00202 530SB00501	acetone	+	J
530SB00101 530SB00402 530SB00101RE 530SB00401RE 530SB00402RE	All associated analytes bromochloromethane 1,4-difluorobenzene chlorobenzene-d <sub>3</sub>	+/-	J/UJ
530SB00401	chlorobenzene-d <sub>3</sub>		
530SB00101 530SB00101RE	All analytes	+/-	J/UJ
530SB00101RE 530SB00401RE 530SB00402RE	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

## DIOXIN/FURANS - 8290

### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24464

A validation was performed on the Dioxin/Furan Data from SDG 24464. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- \* • Blanks
- \* • Laboratory Control Samples
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

### Blanks

Congener ID	MB Conc. (pg/L)	530CB00102	Q
OCDD	0.582	31.9	NA
1,2,3,4,6,7,8-HpCDF	1.03	7.91	NA

## 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
530CB00102	OCDD 1,2,3,4,6,7,8-HpCDF	+B	NA

- \* 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

## 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 # 24464

A validation was performed on the Metals Data from SDG 24464. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.14 mg/kg	no impact
Nickel	0.12 mg/kg	no impact
Tin	2.85 mg/kg	all soil samples

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.

#### 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	Sn.	+	U
All "B" results	all analytes	B	J

## DATA ASSESSMENT NARRATIVE

### ORGANOPHOSPHOROUS PESTICIDES

#### 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 SW-846 Method 8140; 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 # 24464A

A validation was performed on the Organophosphorous Pesticide Data from SDG 24464A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

**DATA ASSESSMENT NARRATIVE  
ORGANOPHOSPHOROUS PESTICIDES**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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

NO QUALIFICATIONS WERE 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

## CHLORINATED HERBICIDES

### 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 SW-846 Method 8150; 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 # 24464

A validation was performed on the Chlorinated Herbicides from SDG 24464. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

NO QUALIFICATIONS WERE 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



# HEARTLAND

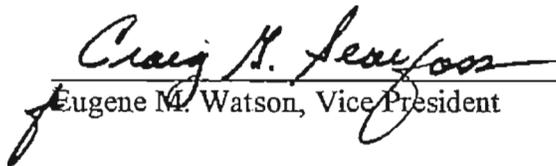
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24464A  
Date: March 13, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 9, 1996  
Number of Samples: 1 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Volatiles, Semivolatiles, Herbicides, Organophosphorus Pesticides, Hexavalent Chromium, Dioxin, Metals

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:

  
Eugene M. Watson, Vice President

3-19-96  
Date

SDG# 24464A

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA		SV		HB		OPP		HCR		DIO		TAL	
530CB00102	SOIL		X		X		X		X		X		X		X
Total Billable Samples (Water/Soil)		0	1	0	1	0	1	0	1	0	1	0	1	0	1

- VOA= SW846 Volatiles
- SV= SW846 Semivolatiles
- HB= SW846 Herbicides
- OPP= SW846 Organophosphorus Pesticides
- HCR= SW846 Hexavalent Chromium
- DIO= SW846 Dioxin
- TAL= SW846 Metals

# 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 8260 Appendix IX; 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 # 24464A

A validation was performed on the Volatile Data from SDG # 24464A. 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.

## DATA ASSESSMENT AND NARRATIVE

### VOLATILE ANALYSIS

PAGE - 2

#### Continuing Calibrations (continued)

##### Specific Finding:

The continuing calibration, K12827, 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).

530CB00102                      acetone

The continuing calibration, K12827, 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).

530CB00102                      vinyl acetate  
   trichlorofluoromethane

The continuing calibration, R21309, 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).

530CB00102                      isobutyl alcohol (46.2)  
   1,4-dioxane  
   dichlorodifluoromethane (100.0)

#### 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

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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
530CB00102	acetone	+	J
530CB00102	vinyl acetate trichlorofluoromethane	+/-	J/UJ
530CB00102	isobutyl alcohol (46.2) 1,4-dioxane dichlorodifluoromethane (100.0)	+/-	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

# DATA ASSESSMENT NARRATIVE METALS

## 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 # 24464

A validation was performed on the Metals Data from SDG 24464. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.14 mg/kg	no impact
Nickel	0.12 mg/kg	no impact
Tin	2.85 mg/kg	all soil samples

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, Manganese and Zinc were. All positive and non-detect results are qualified as estimated, "J" or "UJ".

The Matrix Spike recovery for Cobalt was above the upper control limits. All positive results are qualified as estimated, "J".

### 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

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples	Sn.	+	U
all soil samples	Sb, Mn and Zn.	+/U	J/UJ
all soil samples	Co.	+	J
All "B" results	all analytes	B	J

## DATA ASSESSMENT NARRATIVE

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24464B

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24464B. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### Surrogate Recoveries

One (1) sample required qualification because of surrogate recoveries below the QC limit.

#### Specific Finding

The following sample exhibited a TCMX and DCB recoveries below the QC limits but above 10%. All positive and non-detect results in the sample are qualified as estimated, J/UJ.

604SB00401

**DATA ASSESSMENT NARRATIVE  
CHLORINATED PESTICIDES/PCBs**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance as acceptable. The data reviewer estimates that 5% of data required qualifications/rejections.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
604SB00401	All compounds	+/-	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



# HEARTLAND

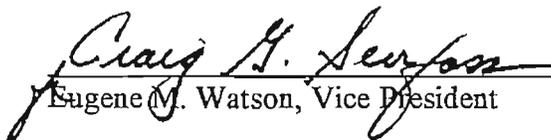
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24471B  
Date: March 26, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 10, 1996  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
12 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, pesticides w/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:

  
Eugene M. Watson, Vice President

4-1-96  
Date

SDG# 24471B

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	TAL	CN
550SB00101	SOIL	X	X			X
550SB00102	SOIL	X	X			X
550SB00201	SOIL	X	X			X
550SB00202	SOIL	X	X			X
550SB00601	SOIL	X	X			X
550SB00602	SOIL	X	X			X
550SB00701	SOIL	X	X			X
550SB00702	SOIL	X	X			X
550SB00801	SOIL	X	X			X
550SB00802	SOIL	X	X			X
GDESB02301	SOIL	X	X	X		X
GDETB02301	WATER	X				
GDESB02302	SOIL	X	X	X		X

Total Billable Samples (Water/Soil) 1 12 0 12 0 2 0 12 0 2

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiled
- P/P = SW846 Pesticides w/PCB's
- TAL = SW846 Metals
- CN = SW846 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 SW846, Method 8240; the National Functional Guidelines for Organic Data Review, June 1991, 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 # 24471B

A validation was performed on the Volatile Data from SDG 24471B. 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, C19240, 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).

550SB00201                      acetone

The continuing calibration, C19265, 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).

550SB00101RE                  acetone  
550SB00801  
550SB00601RE

**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).

550SB00201                      bromochloromethane  
550SB00101                      1,4-difluorobenzene  
550SB00601                      chlorobenzene-d<sub>5</sub>  
550SB00101RE  
550SB00802RE  
GDESB02302  
550SB00102RE

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**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).

550SB00202	1,4-difluorobenzene
550SB00102	chlorobenzene-d <sub>5</sub>
550SB00802	
GDESB02301	
550SB00202RE	
550SB00601RE	
GDESB02301RE	
550SB00201RE	
GDESB02302RE	

**Trip blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
GDETB02301	methylene chloride	47	470
	acetone	7	70
 <u>Samples</u>	 <u>Compound</u>		 <u>Qualification</u>
550SB00102	methylene chloride		CRQL
550SB00202			
550SB00802			
 550SB00101RE	 methylene chloride		 U
550SB00102RE			
550SB00201RE			
550SB00202RE			
550SB00601RE			
550SB00602			
550SB00801			
550SB00802RE			

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 4**

**Trip blanks (continued)**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
GDETB02301	methylene chloride	47	470
	acetone	7	70

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
550SB00101	acetone	U
550SB00102		
550SB00102RE		
550SB00201RE		
550SB00202		
550SB00202RE		
550SB00601		
550SB00701		
550SB00702		
550SB00802		
550SB00802RE		

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that were less than the QA/QC limits. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

550SB00201	toluene-d <sub>8</sub>	65
550SB00101RE		80
GDESB02301RE		76

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

550SB00102	bromofluorobenzene	186
550SB00102RE		174

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 5**

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

550SB00201  
550SB00601  
550SB00101RE  
550SB00802RE  
GDESB02302  
550SB00102RE  
550SB00202RE  
GDESB02301RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
550SB00201	acetone	+	J
550SB00101RE 550SB00801 550SB00601RE	acetone	+	J
550SB00201 550SB00101 550SB00601 550SB00101RE 550SB00802RE GDESB02302 550SB00102RE	All associated analytes bromochloromethane 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>	+/-	J/UJ
550SB00202 550SB00102 550SB00802 GDESB02301 550SB00202RE 550SB00601RE GDESB02301RE 550SB00201RE GDESB02302RE	1,4-difluorobenzene chlorobenzene-d <sub>5</sub>		
550SB00201 550SB00101RE GDESB02301RE	All analytes	+/-	J/UJ
550SB00102 550SB00102RE	All analytes	+	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

Page - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
550SB00201	All analytes	+/-	R
550SB00601			
550SB00101RE			
550SB00802RE			
GDESB02302			
550SB00102RE			
550SB00202RE			
GDESB02301RE			

- \* 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, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24471B

A validation was performed on the Semivolatile Data from SDG 24471B. 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

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE ANALYSIS

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#### Method Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
SBLK1	bis(2-ethylhexyl)phthalate	350J	3500

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
550SB00101	bis(2-ethylhexyl)phthalate	CRQL
550SB00102		
550SB00201		
550SB00202		
550SB00601		
550SB00602		
550SB00701		
550SB00702		
550SB00801		
550SB00802		
GDESB02301		
GDESB02302		

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
550SB00101	bis(2-ethylhexyl)phthalate	+	CRQL
550SB00102			
550SB00201			
550SB00202			
550SB00601			
550SB00602			
550SB00701			
550SB00702			
550SB00801			
550SB00802			
GDESB02301			
GDESB02302			

- \* 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**  
**CHLORINATED PESTICIDES/PCBs**

**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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24471**

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24471. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

**System Performance and Overall Assessment**

Sample GDESB02302 has a dilution performed. The sample has no extrapolated results. Sample and duplicate are in closer agreement than dilution and duplicate. Report sample results and qualify dilution as rejected (R/UR). Overall performance was acceptable. The data did require qualifications/rejections as stated above.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
GDESB02302DL	ALL	+/-	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 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 # 24471

A validation was performed on the Metals Data from SDG 24471. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.11 mg/kg	no impact
Nickel	0.14 mg/kg	no impact
Potassium	52.7 mg/kg	all soil samples below 264 mg/kg
Sodium	12.6 mg/kg	all soil samples below 63.0 mg/kg
Tin	2.38 mg/kg	all soil samples below 11.9 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.

### Serial Dilution Analysis

#### Specific Finding

The Serial dilution for Calcium was outside the control limits. All positive results are qualified as estimated, "J".

#### 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 264 mg/kg	K.	+	U
all soil samples below 63.0 mg/kg	Na.		
all soil samples below 11.9 mg/kg	Sn.		
all soil samples	Ca.	+	J
All "B" results	all analytes	B	J



# HEARTLAND

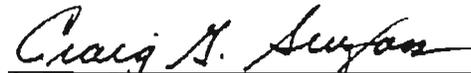
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24471A  
Date: March 26, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 10, 1996  
Number of Samples: 2 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Volatiles, Semivolatiles, Pesticides w/PCB's, Organophosphorus Pesticides, Herbicides, Dioxin/Furans, Hexavalent Chromium, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

4-1-96.  
\_\_\_\_\_  
Date

SDG# 24471A

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	OPP	HB	D/F	HCR	TAL	CN									
550CB00101	SOIL	X	X		X	X	X	X	X										
GDECB02302	SOIL	X	X	X	X	X	X	X	X	X									
Total Billable Samples (Water/Soil)		0	2	0	2	0	1	0	2	0	2	0	2	0	2	0	2	0	1

- VOA = SW846 Volatiles
- SV = SW846 Semivolatiled
- P/P = SW846 Pesticides w/PCB's
- OPP = SW846 Organophosphorus Pesticides
- HB = SW846 Herbicides
- D/F = SW846 Dioxin/Furans
- HCR = SW846 Hexavalent Chromium
- TAL = SW846 Metals
- CN = SW846 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 SW846, Method 8260 Appendix IX; 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 # 24471A

A validation was performed on the Volatile Data from SDG # 24471A. 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.

## DATA ASSESSMENT AND NARRATIVE

### VOLATILE ANALYSIS

PAGE - 2

#### Continuing Calibrations (continued)

##### Specific Finding:

The continuing calibration, C19310, 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).

550CB00101	trichlorofluoromethane (60.2)
GDECB02302	
550CB00101RE	
GDECB02302RE	

The continuing calibration, C19310, 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).

550CB00101	acrolein
GDECB02302	propionitrile
550CB00101RE	isobutyl alcohol (33.3)
GDECB02302RE	1,4-dioxane (33.3)

#### 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).

GDECB02302	bromochloromethane
GDECB02302RE	1,4-difluorobenzene chlorobenzene-d <sub>5</sub>
550CB00101RE	1,4-difluorobenzene chlorobenzene-d <sub>5</sub>
550CB00101	1,4-difluorobenzene

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 3

**Trip Blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
GDETB02301	methylene chloride	47	470
	acetone	7	70

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
550CB00101	methylene chloride	CRQL
GDECB02302		

550CB00101	acetone	U
GDECB02302		

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that were less than the QA/QC limit. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

550CB00101RE	1,2-dichloroethane-d <sub>4</sub>	67
GDECB02302		67
GDECB02302RE		64
GDECB02302RE	toluene-d <sub>8</sub>	80

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

550CB00101RE  
GDECB02302RE

## **DATA ASSESSMENT AND NARRATIVE**

### **VOLATILE ANALYSIS**

**PAGE - 4**

#### **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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
550CB00101 GDECB02302 550CB00101RE GDECB02302RE	trichlorofluoromethane (60.2)	+/-	J/UJ
550CB00101 GDECB02302 550CB00101RE GDECB02302RE	acrolein propionitrile isobutyl alcohol (33.3) 1,4-dioxane (33.3)	+/-	J/R
GDECB02302 GDECB02302RE	All associated analytes bromochloromethane 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>	+/-	J/UJ
550CB00101RE	1,4-difluorobenzene chlorobenzene-d <sub>5</sub>		
550CB00101	1,4-difluorobenzene		
550CB00101 GDECB02302	methylene chloride	+	CRQL
550CB00101 GDECB02302	acetone	+	U
550CB00101RE GDECB02302 GDECB02302RE	All analytes	+/-	J/UJ
550CB00101RE GDECB02302RE	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 SW846, Method 8270; 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 # 24471A

A validation was performed on the Semivolatile Data from SDG 24471A. 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.

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, A1223,-24,-25,-26,-27,-28,-30, 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 detect as estimated (UJ).

550CB00101	1-naphthylamine (57.7)
GDECB02302	diallate (56.8)
	isodrin (64.9)
	2-naphthylamine (60.2)
	1,3-dinitrobenzene (52.7)
	3,3'-dimethylbenzidine (66.4)
	m-cresol (63.0)
	hexachloropropene (60.9)
	parathion (55.4)
	p-phenylenediamine (69.4)

The continuing calibration, A1223,-24,-25,-26,-27,-28,-30, 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).

550CB00101	methapyrilene (72.5)
GDECD02302	4-nitroquinoline-1-oxide (66.0)
	hexachlorophene (67.0)
	aramite

Method Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action level</u>
SBLK1	diethylphthalate	75J	750
	phenanthrene	70J	700
	benzo(a)anthracene	89J	890
	chrysene	72J	720
	bis(2-ethylhexyl)phthalate	120J	1200

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 3

Method Blanks (continued)

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
GDECB02302	phenanthrene	CRQL
	benzo(a)anthracene	CRQL
	chrysene	CRQL
550CB00101	bis(2-ethylhexyl)phthalate	CRQL
GDECB02302		

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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
550CB00101 GDECB02302	1-naphthylamine (57.7) diallate (56.8) isodrin (64.9) 2-naphthylamine (60.2) 1,3-dinitrobenzene (52.7) 3,3'-dimethylbenzidine (66.4) m-cresol (63.0) hexachloropropene (60.9) parathion (55.4) p-phenylenediamine (69.4)	+/-	J/UJ
550CB00101 GDECB02302	methapyrilene (72.5) 4-nitroquinoline-1-oxide (66.0) hexachlorophene (67.0) aramite	+/-	J/R
GDECB02302	phenanthrene benzo(a)anthracene chrysene	+ + +	CRQL CRQL CRQL
550CB00101 GDECB02302	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

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; 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 # 24471

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24471. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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

### ORGANOPHOSPHOROUS PESTICIDES

#### 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 SW-846 Method 8140; 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 # 24471A

A validation was performed on the Organophosphorous Pesticide Data from SDG 24471A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

**DATA ASSESSMENT NARRATIVE  
ORGANOPHOSPHOROUS PESTICIDES**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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

### CHLORINATED HERBICIDES

#### 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 SW-846 Method 8150; 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 # 24471A

A validation was performed on the Chlorinated Herbicides from SDG 24471A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

NO QUALIFICATIONS WERE 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

## METALS HEXAVALENT CHROMIUM 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 # 24471

A validation was performed on the Metals Data from SDG 24471. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.11 mg/kg	no impact
Nickel	0.14 mg/kg	no impact
Potassium	52.7 mg/kg	no impact
Sodium	12.6 mg/kg	no impact
Tin	2.38 mg/kg	all soil samples below 11.9 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.

#### 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 Ensafes request.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
all soil samples below 11.9 mg/kg	Sn.	+	U
All "B" results	all analytes	B	J

# DATA ASSESSMENT NARRATIVE

## DIOXIN/FURANS - 8290

### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

### SDG# 24471

A validation was performed on the Dioxin/Furan Data from SDG 24471. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- Blanks
- \* • Laboratory Control Samples
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

### Blanks

Congener ID	MB Conc. (pg/L)	550CB00101	Q	GDECB02302	Q
OCDD	0.582	25.6	NA	184	NA
1,2,3,4,6,7,8-HpCDF	1.03	2.44	NA	2.78	NA

## 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
All samples	OCDD 1,2,3,4,6,7,8-HpCDF	+B	NA

- \* 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



# HEARTLAND

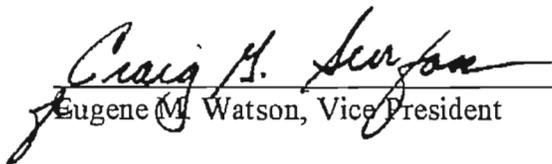
ENVIRONMENTAL SERVICES, INC.

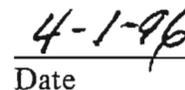
## Data Validation Report

SDG#: 24474  
Date: March 26, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 11, 1996  
Number of Samples: 1 Aqueous Sample(s) with 0 MS/MSD(s)  
7 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest laboratory of Oklahoma  
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, Pesticides w/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:

  
Eugene M. Watson, Vice President

  
Date

SDG# 24474

**Samples and Fractions Reviewed**

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	P/P	TAL	CN					
530SB00601	SOIL	X	X		X						
530SB00701	SOIL	X	X		X						
530SB00801	SOIL	X	X		X						
558TB00101	WATER	X									
558CC00101	SOIL	X	X	X	X	X					
558CC00201	SOIL	X	X	X	X	X					
558CC00401	SOIL	X	X	X	X	X					
558CC00301	SOIL	X	X	X	X	X					
Total Billable Samples (Water/Soil)		1	7	0	7	0	4	0	7	0	4

VOA = SW846 Volatiles  
SV = SW846 Semivolatiled  
P/P = SW846 Pesticides w/PCB's  
TAL = SW846 Metals  
CN = SW846 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 SW846, Method 8240; the National Functional Guidelines for Organic Data Review, June 1991, 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 # 24474B

A validation was performed on the Volatile Data from SDG 24474B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, C19265, 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).

558CC00401                      acetone

The continuing calibration, C19290, 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).

558CC00401RE                      acetone

**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).

558CC00301                      bromochloromethane

530SB00701                      1,4-difluorobenzene

530SB00801                      chlorobenzene-d<sub>5</sub>

558CC00201RE

530SB00701RE

530SB00801RE

558CC00401                      1,4-difluorobenzene

558CC00201                      chlorobenzene-d<sub>5</sub>

558CC00101

558CC00101RE

558CC00401RE

558CC00301RE

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**Trip blanks**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
558TB00101	methylene chloride	10	100
	acetone	8	80

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
530SB00601	methylene chloride	U

530SB00701  
530SB00701RE  
530SB00801  
530SB00801RE  
558CC00101  
558CC00101RE  
558CC00201  
558CC00201RE  
558CC00301  
558CC00301RE  
558CC00401  
558CC00401RE

530SB00701	acetone	U
530SB00701RE		
558CC00101		
558CC00101RE		
558CC00201RE		
558CC00301RE		

558CC00201	acetone	CRQL
558CC00301		
530SB00801RE		

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 4**

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that were less than the QA/QC limits. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

558CC00201RE	toluene-d <sub>8</sub>	78
--------------	------------------------	----

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

558CC00101	bromofluorobenzene	129
558CC00301		127

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

558CC00301  
558CC00201RE  
530SB00701RE  
530SB00801RE  
558CC00401RE  
558CC00101RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
558CC00401	acetone	+	J
558CC00401RE	acetone	+	J
558CC00301	All associated analytes	+/-	J/UJ
530SB00701	bromochloromethane		
530SB00801	1,4-difluorobenzene		
558CC00201RE	chlorobenzene-d <sub>5</sub>		
530SB00701RE			
530SB00801RE			
558CC00401	1,4-difluorobenzene		
558CC00201	chlorobenzene-d <sub>5</sub>		
558CC00101			
558CC00101RE			
558CC00401RE			
558CC00301RE			
530SB00601	methylene chloride	+	U
530SB00701			
530SB00701RE			
530SB00801			
530SB00801RE			
558CC00101			
558CC00101RE			
558CC00201			
558CC00201RE			
558CC00301			
558CC00301RE			
558CC00401			
558CC00401RE			

\* 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

Page - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
530SB00701	acetone	+	U
530SB00701RE			
558CC00101			
558CC00101RE			
558CC00201RE			
558CC00301RE			
558CC00201	acetone	+	CRQL
558CC00301			
530SB00801RE			
558CC00201RE	All analytes	+/-	J/UJ
558CC00101	All analytes	+	J
558CC00301			
558CC00301	All analytes	+/-	R
558CC00201RE			
530SB00701RE			
530SB00801RE			
558CC00401RE			
558CC00101RE			

- \* 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, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24474B

A validation was performed on the Semivolatile Data from SDG 24474B. 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

#### 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).

558CC00401RE	chrysene-d <sub>12</sub>
	perylene-d <sub>12</sub>

## DATA ASSESSMENT AND NARRATIVE

### SEMIVOLATILE ANALYSIS

PAGE - 2

#### 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).

558CC00401	1,4-dichlorobenzene-d <sub>4</sub>
	naphthalene-d <sub>8</sub>
	acenaphthene-d <sub>10</sub>
	phenanthrene-d <sub>10</sub>
	chrysene-d <sub>12</sub>
	perylene-d <sub>12</sub>

#### Compound Identification/Quantitation

##### Specific Finding:

Reject all results for samples listed below, due to non compliant internal standard areas.

558CC00401

For samples 530SB00601 and 530SB00801, reject the E-flagged results in favor of the results from the diluted samples 530SB00601DL and 530SB00801DL.

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
558CC00401RE	All associated analytes chrysene-d <sub>12</sub> perylene-d <sub>12</sub>	+/-	J/UJ
558CC00401	1,4-dichlorobenzene-d <sub>4</sub> naphthalene-d <sub>8</sub> acenaphthene-d <sub>10</sub> phenanthrene-d <sub>10</sub> chrysene-d <sub>12</sub> perylene-d <sub>12</sub>		
558CC00401	All analytes	+/-	R
530SB00601 530SB00801	E-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 NARRATIVE**  
**CHLORINATED PESTICIDES/PCBs**

**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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24474**

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24474. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did not require qualifications/rejections.



## SUMMARY OF DATA QUALIFICATIONS

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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 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 # 24474

A validation was performed on the Metals Data from SDG 24474. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.15 mg/kg	no impact
Manganese	0.16 mg/kg	no impact
Nickel	0.11 mg/kg	no impact
Potassium	51.8 mg/kg	no impact
Sodium	12.3 mg/kg	all soil samples below 61.5 mg/kg

Tin 2.58 mg/kg all soil samples below 12.9 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.

#### 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 61.5 mg/kg	Na.	+	U
all soil samples below 12.9 mg/kg	Sn.		
All "B" results	all analytes	B	J



# HEARTLAND

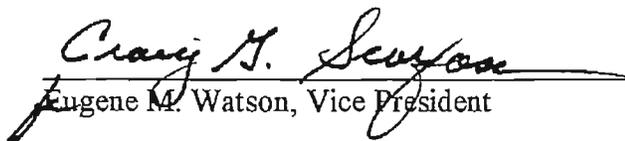
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24503A  
Date: March 26, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 16, 1996  
Number of Samples: 1 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Volatiles, Semivolatiles, Organophosphorus Pesticides, Herbicides, Dioxin/Furans, pH, Hexavalent Chromium, Metals

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:

  
Eugene M. Watson, Vice President

4-1-96  
Date

SDG# 24503A

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA	SV	OPP	HB	D/F	pH	HCR	TAL						
570CB00901	SOIL	X	X	X	X	X	X	X	X						
Total Billable Samples (Water/Soil)		0	1	0	1	0	1	0	1	0	1	0	1	0	1

- VOA = SW846 Volatiles
- SV = SW846 Semivolatile
- OPP = SW846 Organophosphorus Pesticides
- HB = SW846 Herbicides
- D/F = SW846 Dioxin/Furans
- pH = SW846 pH
- HCR = SW846 Hexavalent Chromium
- TAL = SW846 Metals

## **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 8260 Appendix IX; 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 # 24503A

A validation was performed on the Volatile Data from SDG # 24503A. 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.

## DATA ASSESSMENT AND NARRATIVE

### VOLATILE ANALYSIS

PAGE - 2

#### Continuing Calibrations (continued)

##### Specific Finding:

The continuing calibration, K12934, 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).

570CB00901	vinyl acetate trichlorofluoromethane
------------	---

The continuing calibration, K12934, 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).

570CB00901	acrolein isobutyl alcohol (38.5) 1,4-dioxane
------------	--

#### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
570CB00901	vinyl acetate trichlorofluoromethane	+/-	J/UJ
570CB00901	acrolein isobutyl alcohol (38.5) 1,4-dioxane	+/-	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

## 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, and DQO Level IV. All comments made within this report should be considered when examining the analytical results (Form I's).

#### SDG # 24503A

A validation was performed on the Semivolatile Data from SDG 24503A. 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.

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ANALYSIS

PAGE - 2

Continuing calibrations (continued)

Specific Finding:

The continuing calibration, A1223,-24,-25,-26,-27,-28,-30, 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 detect as estimated (UJ).

570CB00901                      1-naphthylamine (57.7)  
   diallate (56.8)  
   isodrin (64.9)  
   2-naphthylamine (60.2)  
   1,3-dinitrobenzene (52.7)  
   3,3'-dimethylbenzidine (66.4)  
   m-cresol (63.0)  
   hexachloropropene (60.9)  
   parathion (55.4)  
   p-phenylenediamine (69.4)

The continuing calibration, A1223,-24,-25,-26,-27,-28,-30, 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).

5750CB009101                      methapyrilene (72.5)  
   4-nitroquinoline-1-oxide (66.0)  
   hexachlorophene (67.0)  
   aramite

Method Blanks

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action level</u>
SBLK1	bis(2-ethylhexyl)phthalate	36J	360

<u>Samples</u>	<u>Compound</u>	<u>Qualification</u>
570CB00901	bis(2-ethylhexyl)phthalate	CRQL

**DATA ASSESSMENT AND NARRATIVE**

**SEMIVOLATILE 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
570CB00901	1-naphthylamine (57.7) diallate (56.8) isodrin (64.9) 2-naphthylamine (60.2) 1,3-dinitrobenzene (52.7) 3,3'-dimethylbenzidine (66.4) m-cresol (63.0) hexachloropropene (60.9) parathion (55.4) p-phenylenediamine (69.4)	+/-	J/UJ
570CB00901	methapyrilene (72.5) 4-nitroquinoline-1-oxide (66.0) hexachlorophene (67.0) aramite	+/-	J/R
570CB00901	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

## ORGANOPHOSPHOROUS PESTICIDES

### 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 SW-846 Method 8140; 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 # 24503A

A validation was performed on the Organophosphorous Pesticide Data from SDG 24503A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

**DATA ASSESSMENT NARRATIVE  
ORGANOPHOSPHOROUS PESTICIDES**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did not require qualifications/rejections.

## **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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

NO QUALIFICATIONS WERE 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

## CHLORINATED HERBICIDES

### 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 SW-846 Method 8150; 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 # 24503A

A validation was performed on the Chlorinated Herbicides from SDG 24503A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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 METALS AND HEX CHROMIUM

## 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 # 24503

A validation was performed on the Metals Data from SDG 24503. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.12 mg/kg	no impact
Nickel	0.12 mg/kg	no impact
Potassium	45.8 mg/kg	all soil samples below 229 mg/kg
Sodium	16.7 mg/kg	all soil samples below 83.5 mg/kg
Tin	2.59 mg/kg	all soil samples below 13.0 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 contamination but had no impact on the data.

## Matrix Spike Recovery

### Specific Finding

The Matrix Spike recoveries for soils for Antimony (66%), Cobalt (74%), Lead (40%), Thallium (70%) and Zinc (59%) were 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 soils for Manganese (157%) was above the upper control limits (.125%). All positive results are qualified as estimated, "J".

## Duplicate Analysis

### Specific Finding

The laboratory duplicate results for soils for Aluminum (38%), Calcium (57%), Iron (60%) and Lead (46%) were greater than 35%. All positive results are qualified as estimated, "J". The RPD for Zinc (34%) was not greater than 35% and will not be qualified.

The field duplicate results for Zinc (174%) for soils was greater than 50% and all positive results will be qualified as estimated, "J" for all soil samples.

## Serial Dilution

### Specific Finding

The Serial dilutions for soils for Calcium, Lead, Magnesium and Potassium were outside the control limits. All positive results will be qualified as estimated, "J" for all soil samples.

### 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 229 mg/kg	K.	+	U
all soil samples below 83.5 mg/kg	Na.		
all soil samples below 13.0 mg/kg	Sn.		
all soil samples	Sb, Co, Pb, Tl and Zn.	+/U	J/UJ
all soil samples	Mn.	+	J
all soil samples	Al, Ca, Fe, Pb and Zn.	+	J
all soil samples	Ca, Pb, Mg and K.	+	J
All "B" results	all analytes	B	J

## DATA ASSESSMENT NARRATIVE

### DIOXIN/FURANS - 8290

#### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24503

A validation was performed on the Dioxin/Furan Data from SDG 24503. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- \* • Blanks
- \* • Laboratory Control Samples
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

## 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

CONGENER 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



# HEARTLAND

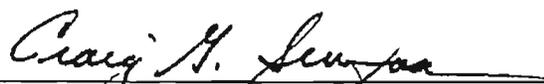
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24503B  
Date: March 26, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 16, 1996  
Number of Samples: 3 Aqueous Sample(s) with 0 MS/MSD(s)  
14 Non-aqueous Sample(s) with 2 MS/MSD(s)  
Laboratory: Southwest laboratory of oklahoma  
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, Pesticides w/PCB's, pH, Metals

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:

  
Eugene M. Watson, Vice President

4-1-96  
Date

SDG# 24503B

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA		SV		P/P		pH		TAL	
550EB00601	WATER	X		X		X				X	
550DB00601	WATER	X		X		X				X	
570SB00501	SOIL		X		X				X		X
570TB00501	WATER	X									
570SB00502	SOIL		X		X				X		X
570SB00601	SOIL		X		X				X		X
570SB00602	SOIL		X		X				X		X
570SB00701	SOIL		X		X				X		X
570SB00702	SOIL		X		X				X		X
570SB00801	SOIL		X		X				X		X
570SB00802	SOIL		X		X				X		X
570SB00901	SOIL		X		X				X		X
570SB00902	SOIL		X		X				X		X
570SB01001	SOIL		X		X				X		X
570SB01002	SOIL		X		X				X		X
GDESB01102	SOIL		X		X		X				X
GDESB01101	SOIL		X		X		X				X
Total Billable Samples (Water/Soil)		3	14	2	14	2	2	0	12	2	14

VOA = SW846 Volatiles

SV = SW846 Semivolatiled

P/P = SW846 Pesticides w/PCB's

pH = SW846 pH

TAL = SW846 Metals

# 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, June 1991, 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 # 24503B

A validation was performed on the Volatile Data from SDG 24503B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, C19319, 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).

570SB00501	methylene chloride
570SB00502	
570SB00601	
570SB00602	
570SB00701	
570SB00702	
570SB00802	
570SB00901	
570SB00902	
570SB01001	
570SB01002	
GDESB01101	
GDESB01102	

The continuing calibration, C19338, 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).

570SB00601RE	methylene chloride
570SB00602RE	acetone
570SB00501RE	
570SB00502RE	
570SB00701RE	
570SB00702RE	
570SB00801	
570SB00902RE	
570SB01001RE	
570SB01002RE	
GDESB01101RE	
GDESB01102RE	

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, C19359, 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).

570SB00802RE	methylene chloride
570SB00901RE	acetone

**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).

570SB00601	bromochloromethane
570SB00602	1,4-difluorobenzene
570SB00501	chlorobenzene-d <sub>5</sub>
570SB00701	
570SB00702	
570SB00901	
570SB00902	
570SB01001	
570SB01002	
570SB01101	
570SB01102	
570SB00601RE	
570SB00602RE	
570SB00501RE	
570SB00502RE	
570SB00701RE	
570SB00902RE	
570SB01001RE	
570SB01102RE	
570SB00802RE	
570SB00901RE	

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 4**

**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).

570SB00502	1,4-difluorobenzene
570SB00802	chlorobenzene-d <sub>5</sub>
570SB00702RE	
570SB00801	
570SB01002RE	
570SB01101RE	

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that were less than the QA/QC limits. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

570SB00602	toluene-d <sub>8</sub>	79
570SB01002	toluene-d <sub>8</sub>	78
570SB00802RE	bromofluorobenzene	130

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

570SB00701	toluene-d <sub>8</sub>	144
570SB00701RE		144
570SB00702	bromofluorobenzene	135
570SB00802		129
GDESB01102		123
570SB00602RE		124
570SB00502RE		130
570SB00702RE		129
570SB01001RE		128
570SB01002RE		124
GDESB01102RE		123

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 5**

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

570SB00702  
570SB01002  
570SB01101  
570SB00601RE  
570SB00602RE  
570SB00501RE  
570SB00502RE  
570SB00701RE  
570SB00902RE  
570SB01001RE  
570SB01102RE  
570SB00802RE  
570SB00901RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>	
570SB00501	methylene chloride	+	J	
570SB00502				
570SB00601				
570SB00602				
570SB00701				
570SB00702				
570SB00802				
570SB00901				
570SB00902				
570SB01001				
570SB01002				
GDESB01101				
GDESB01102				
570SB00601RE				methylene chloride
570SB00602RE	acetone			
570SB00501RE				
570SB00502RE				
570SB00701RE				
570SB00702RE				
570SB00801				
570SB00902RE				
570SB01001RE				
570SB01002RE				
GDESB01101RE				
GDESB01102RE				

- \* 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

Page - 2

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
570SB00601	All associated analytes	+/-	J/UJ
570SB00602	bromochloromethane		
570SB00501	1,4-difluorobenzene		
570SB00701	chlorobenzene-d <sub>5</sub>		
570SB00702			
570SB00901			
570SB00902			
570SB01001			
570SB01002			
570SB01101			
570SB01102			
570SB00601RE			
570SB00602RE			
570SB00501RE			
570SB00502RE			
570SB00701RE			
570SB00902RE			
570SB01001RE			
570SB01102RE			
570SB00802RE			
570SB00901RE			
570SB00502	1,4-difluorobenzene		
570SB00802	chlorobenzene-d <sub>5</sub>		
570SB00702RE			
570SB00801			
570SB01002RE			
570SB01101RE			

- \* 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

Page - 3

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
570SB00602 570SB01002 570SB00802RE	All analytes	+/-	J/UJ
570SB00701 570SB00701RE 570SB00702 570SB00802 GDESB01102 570SB00602RE 570SB00502RE 570SB00702RE 570SB01001RE 570SB01002RE GDESB01102RE	All analytes	+	J
570SB00702 570SB01002 570SB01101 570SB00601RE 570SB00602RE 570SB00501RE 570SB00502RE 570SB00701RE 570SB00902RE 570SB01001RE 570SB01102RE 570SB00802RE 570SB00901RE	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 SW846, Method 8270; National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

### SDG # 24503B

A validation was performed on the Semivolatile Data from SDG 24503B. 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

### 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

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

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24503

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24503. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- \* Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
------------------	----------------	-----------	-----------

NO QUALIFICATIONS WERE 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 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 # 24503

A validation was performed on the Metals Data from SDG 24503. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.12 mg/kg	no impact
Nickel	0.12 mg/kg	no impact
Potassium	45.8 mg/kg	no impact
Sodium	16.7 mg/kg	all soil samples below 83.5 mg/kg
Tin	2.59 mg/kg	all soil samples below 13.0 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 contamination but had no impact on the data.

#### 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 83.5 mg/kg	Na.	+	U
all soil samples below 13.0 mg/kg	Sn.		
All "B" results	all analytes	B	J



# HEARTLAND

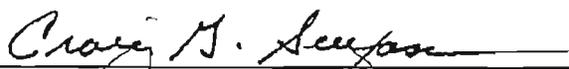
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24529  
Date: March 26, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 17 - 23, 1996  
Number of Samples: 10 Aqueous Sample(s) with 0 MS/MSD(s)  
10 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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, Pesticides w/PCB's, PCB's, Metals w/Mercury, 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:

  
\_\_\_\_\_  
Eugene M. Watson, Vice President

4-1-96  
\_\_\_\_\_  
Date

SDG# 24529

Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	VOA		SV		P/P		PCB	TAL/HG	TAL		CN			
5705000501	SOIL	X		X		X					X		X		
5706000501	SOIL	X		X		X					X		X		
5707000501	WATER	X		X		X					X		X		
570E000501	WATER	X		X		X					X		X		
5703000501	WATER	X		X		X					X		X		
570TB00501	WATER	X													
570EB00501	WATER	X		X		X					X		X		
570DB00501	WATER	X		X		X					X		X		
222GW001GP	WATER							X							
222GW002GP	WATER							X							
222GW003GP	WATER							X							
222GW004GP	WATER							X							
145SB00401	SOIL									X					
145SB00402	SOIL									X					
145SB00601	SOIL									X					
145SB00602	SOIL									X					
145SB00701	SOIL									X					
145SB00702	SOIL									X					
145SB00801	SOIL									X					
145SB00802	SOIL									X					
Total Billable Samples (Water/Soil)		6	2	5	2	5	2	4	0	0	8	5	2	5	2

- VOA= SW846 Volatiles
- SV= SW846 Semivolatiled
- P/P= SW846 Pesticides w/PCB's
- PCB= SW846 PCB's
- TAL/HG= SW846 Metals; Mercury
- TAL= SW846 Metals
- CN= SW846 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 SW846, Method 8240; the National Functional Guidelines for Organic Data Review, June 1991, 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 # 24529B

A validation was performed on the Volatile Data from SDG 24529B, 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.

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 2**

**Continuing calibrations (continued)**

**Specific Finding:**

The continuing calibration, C19379, 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).

5705000501	acetone
5705000501RE	
5706000501	
5706000501RE	

**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).

5705000501	bromochloromethane
5705000501RE	1,4-difluorobenzene
5706000501	chlorobenzene-d <sub>5</sub>
5706000501RE	

**Rinseate Blank**

<u>Associated blank</u>	<u>Compound</u>	<u>Conc.</u>	<u>Action Level</u>
570EB00501	chloroform	5	25
<u>Samples</u>	<u>Compound</u>		<u>Qualification</u>
5707000501	chloroform		U
5703000501			

**DATA ASSESSMENT AND NARRATIVE  
VOLATILE ANALYSIS**

**PAGE - 3**

**Surrogates**

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

**Specific Finding:**

The samples listed below, exhibited surrogate recoveries that were less than the QA/QC limits. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

5706000501	toluene-d <sub>8</sub>	80
------------	------------------------	----

The samples listed below, exhibited surrogate recoveries that exceeded the QA/QC limit. Qualify all positive results as estimated (J).

5705000501RE	bromofluorobenzene	124
5706000501RE		137

**Compound Identification/Quantitation**

**Specific Finding:**

Reject (R) all results for the re-analyzed samples listed below, due to non compliant surrogate recoveries and /or non compliant internal standard areas.

5705000501RE  
5706000501RE

**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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
5705000501 5705000501RE 5706000501 5706000501RE	acetone	+	J
5705000501 5705000501RE 5706000501 5706000501RE	All associated analytes bromochloromethane 1,4-difluorobenzene chlorobenzene-d <sub>5</sub>	+/-	J/UJ
5707000501 5703000501	chloroform	+	U
5706000501	All analytes	+/-	J/UJ
5705000501RE 5706000501RE	All analytes	+	J
5705000501RE 5706000501RE	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

### CHLORINATED PESTICIDES/PCBs

#### 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 SW-846 Method 8080; the National Functional Guidelines for Organic Data Validation, June 1991, 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 # 24529

A validation was performed on the Chlorinated Pesticide/PCB Data from SDG 24529. The data was evaluated based on the following parameters:

- \* Data Completeness
- \* Holding Times
- \* Calibration
- \* Blanks
- Surrogate Recoveries
- \* Matrix Spike/Matrix Spike Duplicates
- \* Field Duplicates
- \* Compound Identification
- \* Compound Quantitation

\* - All criteria were met for this parameter.

#### Surrogate Recoveries

One sample exhibits surrogate recoveries greater than 10% and less than the lower limit. Qualify all positive results as estimated (J) and all non-detects as estimated (UJ).

<u>Sample ID</u>	<u>Surrogate</u>	<u>%Rec</u>
222GW003GP	TCX-1	11
222GW003GP	TCX-2	18
222GW003GP	DCB-1	22
222GW003GP	DCB-2	15

## System Performance and Overall Assessment

Overall performance was acceptable. The data did require qualifications/rejections as stated above.

### 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 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 the 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

<u>SAMPLE ID</u>	<u>ANALYTE</u>	<u>DL</u>	<u>QL</u>
222GW003GP	ALL	+/-	J/UJ

<u>SAMPLE ID</u>	<u>SURROGATE</u>	<u>%REC</u>
222GW003GP	TCX-1	11
222GW003GP	TCX-2	18
222GW003GP	DCB-1	22
222GW003GP	DCB-2	15

- \* 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 # 24529

A validation was performed on the Metals Data from SDG 24529. 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.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Chromium	0.12 mg/kg	all soil samples below 0.60 mg/kg
Potassium	14.0 mg/kg	all soil samples below 70.0 mg/kg
Sodium	10.9 mg/kg	all soil samples below 54.5 mg/kg
Tin	2.57 mg/kg	all soil samples below 12.9 mg/kg

All field QC samples exhibited contamination for the following elements.

<u>Elements</u>	<u>Conc.</u>	<u>Samples affected</u>
Mercury	0.54 ug/l	all water samples below 2.7 ug/l
Calcium	614 ug/l	no impact
Iron	588 ug/l	all water samples below 2940 ug/l
Manganese	19.7 ug/l	all water samples below 98.5 ug/l
Potassium	374 ug/l	all water samples below 1870 ug/l
Sodium	1980 ug/l	all water samples below 9900 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.

### Serial Dilution Analysis

#### Specific Finding

The Serial dilutions for Potassium and Zinc were outside the control limits. All positive results are qualified as estimated, "J".

#### 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 0.60 mg/kg	Cr.	+	U
all soil samples below 70.0 mg/kg	K.		
all soil samples below 54.5 mg/kg	Na.		
all soil samples below 12.9 mg/kg	Sn.		
all water samples below 2.7 ug/l	Hg.		
all water samples below 2940 ug/l	Fe.		
all water samples below 98.5 ug/l	Mn.		
all water samples below 1870 ug/l	K.		
all water samples below 9900ug/l	Na.		
all soil samples	K and Sn.	+	J
All "B" results	all analytes	B	J



# HEARTLAND

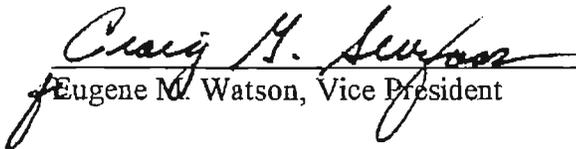
ENVIRONMENTAL SERVICES, INC.

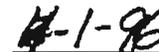
## Data Validation Report

SDG#: 24568A  
Date: March 26, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 24 - 25, 1996  
Number of Samples: 16 Non-aqueous Sample(s) with 1 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: Metals; Mercury

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:

  
Eugene M. Watson, Vice President

  
Date]

SDG# 24568A

### Samples and Fractions Reviewed

Sample Identifications    Analytical Fractions

ENSAFE ID	MATRIX	HG	
145SB00101	SOIL		X
145SB00102	SOIL		X
145SB00201	SOIL		X
145SB00202	SOIL		X
145SB00301	SOIL		X
145SB00302	SOIL		X
145SB00501	SOIL		X
145SB00502	SOIL		X
145SB00901	SOIL		X
145SB00902	SOIL		X
145SB01001	SOIL		X
145SB01002	SOIL		X
145SB01101	SOIL		X
145SB01102	SOIL		X
145SB01201	SOIL		X
145SB01202	SOIL		X
Total Billable Samples (Water/Soil)		0	16

HG = SW846 Metals; Mercury

# DATA ASSESSMENT NARRATIVE MERCURY

## 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 # 24568

A validation was performed on the Metals Data from SDG 24568. 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.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	Q
Data stands as reported without qualification.			



# HEARTLAND

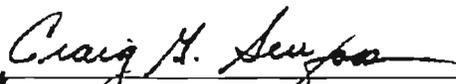
ENVIRONMENTAL SERVICES, INC.

## Data Validation Report

SDG#: 24568B  
Date: March 26, 1996  
Client Name: Ensafe/Allen & Hoshall  
Project/Site Name: Charleston; Zone E  
Date Sampled: January 24 - 25, 1996  
Number of Samples: 2 Non-aqueous Sample(s) with 0 MS/MSD(s)  
Laboratory: Southwest Laboratory of Oklahoma  
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: SW846 Third Edition  
Analytical Fractions: Herbicides, Organophosphorus Pesticides, Hexavalent Chromium, Dioxin, Metals (Mercury)

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:

  
Eugene M. Watson, Vice President

4-1-96  
Date

SDG# 24568B

### Samples and Fractions Reviewed

Sample Identifications

Analytical Fractions

ENSAFE ID	MATRIX	HB		OPP		HCR		DIO		TAL	
145CB00901	SOIL	X		X		X		X		X	
145CB01001	SOIL	X		X		X		X		X	
Total Billable Samples (Water/Soil)		0	2	0	2	0	2	0	2	0	2

HB = SW846 Herbicides

OPP = SW846 Organophosphorus Pesticides

HCR = SW846 Hexavalent Chromium

DIO = SW846 Dioxin

TAL = SW846 Metals; Mercury

# DATA ASSESSMENT NARRATIVES

# DATA ASSESSMENT NARRATIVE

## CHLORINATED HERBICIDES

### 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 SW-846 Method 8150; 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 # 24568A

A validation was performed on the Chlorinated Herbicides from SDG 24568A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

### System Performance and Overall Assessment

Overall performance was acceptable. The data did not require 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
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NO QUALIFICATIONS WERE 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

## ORGANOPHOSPHOROUS PESTICIDES

### 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 SW-846 Method 8140; 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 # 24568A

A validation was performed on the Organophosphorous Pesticide Data from SDG 24568A. The data was evaluated based on the following parameters:

- \* • Data Completeness
- \* • Holding Times
- \* • Calibration
- \* • Blanks
- \* • Surrogate Recoveries
- \* • Matrix Spike/Matrix Spike Duplicates
- \* • Field Duplicates
- \* • Compound Identification
- \* • Compound Quantitation

\* - All criteria were met for this parameter.

**DATA ASSESSMENT NARRATIVE  
ORGANOPHOSPHOROUS PESTICIDES**

**PAGE - 2**

**System Performance and Overall Assessment**

Overall performance was acceptable. The data did not require qualifications/rejections.

## 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

<u>SAMPLE ID</u>	<u>ANALYTE ID</u>	<u>DL</u>	<u>QL</u>
------------------	-------------------	-----------	-----------

NO QUALIFICATIONS WERE 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 MERCURY AND HEXAVALENT CHROMIUM

### 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 # 24568

A validation was performed on the Metals Data from SDG 24568. 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.

## SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	Q
Data stands as reported without qualification.			

## DATA ASSESSMENT NARRATIVE

### DIOXIN/FURANS - 8290

#### 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, internal standard recoveries, clean-up standard recoveries, matrix spike recoveries, GC/MS high resolution performance, tuning results, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. SW-846 Method 8290; the National Functional Guidelines for Organic Data Review, where applicable; and EPA DQO Level IV requirements. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

#### SDG# 24568

A validation was performed on the Dioxin/Furan Data from SDG 24568. The data was evaluated based on the following parameters.

- \* • Data Completeness
- \* • Holding Times
- \* • Mass Resolution Checks
- \* • Column Performance
- \* • Calibrations
- \* • Internal Standard Recovery
- \* • Blanks
- \* • Laboratory Control Samples
- \* • Matrix Spike/Matrix Spike Duplicate
- \* • Field Duplicates
- \* • Congener Identification/Quantitation

\* - All criteria were met for this parameter.

#### Blanks

Congener ID	MB Conc. (pg/L)	145CB00901	Q	145CB01001	Q
OCDD	0.719	15.6	NA	43.6	NA
1,2,3,4,6,7,8-HpCDF	6.47			9.36	NA
OCDF	7.4			1.09	U

**Data Assessment Narrative**  
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**Compound Identification/Quantitation**

Sample 145CB00901 exhibited a positive result for 2,3,7,8-TCDF on the primary column. However, the result did not confirm on a second column. Therefore, report the result from the first column as qualified non detect (U).

## 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

<u>SAMPLE ID</u>	<u>CONGENER ID</u>	<u>DL</u>	<u>QL</u>
145CB01001	OCDD 1,2,3,4,6,7,8-HpCDF	+B	NA
145CB00901	OCDF OCDD	+B +B	U NA
145CB00901	2,3,7,8-TCDF	XN	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

# 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: Charleston Naval Base, Zone E  
PROJECT NUMBER: 8500.014  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Soil  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's  
  
SDG NO: 25630A

### SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/ PCDF</u>
578CB00401	25631.01	Soil	X

D = DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 25630A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 578CB00401

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was taken.

##### Mass Verification:

All criteria were met, so no action was required.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

##### Initial Calibration and Continuing Calibration Check:

All criteria were met, so no action was taken.

IV.) Blanks:

All criteria were met, so no action was taken.

Field Blanks:

No field blank was analyzed.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD were analyzed.

One LCS sample was analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

No field duplicates were analyzed.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was required.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable without qualifications.

# 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: Charleston Navel Base, Zone E  
PROJECT NUMBER: 8500.14  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRICES: Soil and Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Organophosphorus Pesticides, Chlorinated Herbicides, Total Metals, pH  
SDG NUMBERS: 25630A (Appendix IX, Level IV)  
25630B (Level III)

### SAMPLES:

#### SDG 25630A (Level IV):

Client	Lab		Volatile	Semi-	Chlorinated
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>Herbicides</u>
578CB00401*	25631.01	Soil	X	X	X
578CB00401RE	25631.01RE	Soil	X	X	

Client	Lab		Organophos.	Total	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Pesticides</u>	<u>Metals</u>	<u>pH</u>
578CB00401*	25631.01	Soil	X	X	X

\* = Field duplicate sample was associated with sample 578SB00401 in SDG 25630B.

C = FIELD DUPLICATE, RE = REANALYSIS

SDG 25630B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Total Metals	pH
578SB00101	25630.01	Soil	X	X	X	X
578SB00102	25630.02	Soil	X	X	X	X
578SB00201	25630.03	Soil	X	X	X	X
578SB00201RE	25630.03RE	Soil	X			
578SB00202	25630.04	Soil	X	X	X	X
578SB00301	25630.05	Soil	X	X	X	X
578SB00301DL	25630.05DL	Soil	X			
578SB00302	25630.06	Soil	X	X	X	X
578SB00401*	25630.07	Soil	X	X	X	X
578SB00401RE	25630.07RE	Soil	X			
578SB00402	25630.10	Soil	X	X	X	X
578SB00501	25630.11	Soil	X	X	X	X
578SB00502	25630.12	Soil	X	X	X	X
578SB00601	25630.13	Soil	X	X	X	X
578SB00602	25630.16	Soil	X	X	X	X
578TB00602	25630.17	Water	X			
578SB00401MS	25630.07MS	Soil		+		
578SB00401MSD	25630.07MSD	Soil		+		
578SB00601MS	25630.13MS	Soil			+	
578SB00601MD	25630.13MD	Soil			+	

\* = Sample was associated with field duplicate sample 578CB00401 in SDG 25630A.

+ = Non-billable Quality Control Samples

DL = DILUTION, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, T = TRIP BLANK

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

RELEASE SIGNATURE:



## Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 25630A Appendix IX, CLP Organics and Inorganics

SAMPLES: 578CB00401, 578CB00401RE

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC/MS Tuning:

All GC/MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The Relative Response Factors (RRF's) for acrolein (0.034), acetonitrile (0.026), isobutyl alcohol (0.007) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standard run on 2/01/96 on instrument C. The results for these compounds in associated samples 578CB00401 and 578CB00401RE, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/01/96 on instrument C for the following compounds:

chloromethane	31.2%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%
chloroprene	30.7%
acrylonitrile	31.2%
propionitrile	30.9%
methacrylonitrile	30.6%
isobutyl alcohol	48.6%
1,4-dioxane	35.2%
1,2,3-trichloropropane	32.1%
dibromomethane	32.3%

The results for isobutyl alcohol and 1,4-dioxane in the associated samples were previously rejected. There were no positive results for the other compounds in the associated samples. No further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRF's) of acrolein (0.011), acetonitrile (0.022), isobutyl alcohol (0.006), propionitrile (0.045), 2-chloroethyl vinyl ether (0.041) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards run on 5/24/96 at 12:21 on instrument C. The non-detect results for propionitrile and 2-chloroethyl vinyl ether in samples 578CB00401 and 578CB00401RE were rejected (R). All results for acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane in the associated samples were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D) exceeded the 25% QC limit for the standard run on 5/24/96 at 12:21 on instrument C for the following compounds:

2-chloroethyl vinyl ether	63.1%
chloroethane	25.7%
vinyl acetate	40.7%
acrolein	67.6%
propionitrile	26.2%
dichlorodifluoromethane	30.1%
trichlorofluoromethane	73.0%

The results for 2-chloroethyl vinyl ether, acrolein and propionitrile in the associated samples were previously rejected because of low RRF's in the initial calibration and this continuing calibration. The results for the other compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive results in the method blanks for this SDG. No action was required.

Trip Blanks:

There were no positive results for the trip blank, analyzed in SDG 25630B. No action was required.

TIC's:

All TIC criteria were met, so no action was taken.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of bromofluorobenzene were 58% and 60% in samples 578CB00401 and 578CB00401RE, respectively, which were below the 74-121% QC limits. All positive and non-detect results for these samples were flagged as estimated (J) and (UJ).

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD's were not analyzed for this fraction. No action was required.

VIII.) Field Duplicates:

The only calculable Relative Percent Difference (RPD) for field duplicate samples 578CB00401 and 578SB00401 (analyzed in SDG 25630B) was for methylene chloride (11%). This RPD was within the 60% QC limit for soil samples, so no action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recovery (%R) of chlorobenzene-d5 (41%) was less than the 50-200% QC limits for sample 578CB00401. All positive and non-detect results for the compounds quantitated on this ISTD were previously flagged as estimated (J) and (UJ) due to a low surrogate recovery. No further action was required.

The Percent Recoveries (%R's) of bromochloromethane (19%), 1,4-dichlorobenzene (14%) and chlorobenzene-d5 (11%) were below the 50-200% QC limits for sample 578CB00401RE. Since the %R's were less than 25%, all positive results for this sample were flagged as estimated (J) and all non-detect results were rejected (R).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All results for acrolein, acetonitrile, isobutyl alcohol, propionitrile, 2-chloroethyl vinyl ether and 1,4-dioxane, which consisted entirely of non-detects, in samples 578CB00401 and 578CB00401RE were rejected (R) due to low RRF's in the initial and continuing calibrations. All non-detect results for sample 578CB00401RE were rejected (R) due to low ISTD Percent Recoveries. The original analysis of sample 578CB00401 was considered by the validator to be preferable to the reanalysis for this reason. All other laboratory data were acceptable with qualifications.

## SEMIVOLATILE ORGANICS

### I.) Holding Times:

All Holding Time criteria were met. No action was required.

### II.) GC/MS Tuning:

All GC/MS Tuning criteria were met, so no action was taken.

### III.) Calibration:

#### Initial Calibration:

The average Relative Response Factor (RRF) for aramite (0.030) was below the 0.050 QC limit for the standard analyzed on 5/08/96 on instrument A. The results for this compound in associated samples 578CB00401 and 578CB00401RE, which were both non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 5/08/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
n-nitrosomorpholine	33.4%
o-toluidine	37.3%
1-nitroso-piperidine	35.0%
o,o ,o-triethyl phosphorothionate	35.1%
2,6-dichlorophenol	33.6%
hexachloropropene	32.8%
n-nitroso-di-n-butylamine	32.9%
1,2,4,5-tetrachlorobenzene	34.7%
isosafrole	32.8%
1,4-napthaquinone	35.4%
1,3-dinitrobenzene	35.1%
1-naphthylamine	37.8%
4-nitroquinoline-1-oxide	39.5%
2-naphthylamine	35.1%
thionazin	36.9%
2-methyl-5-nitroaniline	35.7%
diphenylamine	31.5%
sulfotepp	35.8%
phorate	36.4%
phenacetin	33.3%
diallate	35.0%

dimethoate	37.6%
4-aminobiphenyl	32.0%
pronamide	37.5%
pentachloronitrobenzene	45.3%
disulfoton	37.7%
methyl parathion	36.4%
parathion	37.4%
methapyrilene	44.3%
isodrin	35.3%
chlorobenzilate	39.3%
3,3'-dimethylbenzidine	43.5%
kepone	32.0%
famphur	70.0%
2-acetylaminofluorene	35.4%
7,12-dimethylbenz(a)anthracene	47.9%

Since these compounds were not detected in the two associated samples, no action was required.

#### Continuing Calibration:

The Relative Response Factor (RRF) for aramite (0.034) was below the 0.050 QC limit for the standards analyzed on 6/02/96 on instrument A. The non-detect results for aramite were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/02/96 on instrument A for the following compounds:

2,2'-oxybis-1-chloropropane	33.7%
2,6-dichlorophenol	80.7%
hexachloropropene	53.1%
1,2,4,5-tetrachlorobenzene	32.9%
pentachlorobenzene	48.6%
2,4,6-trichlorophenol	70.6%
butylbenzylphthalate	33.2%
bis-2-ethylhexyl)phthalate	34.0%
n-nitrosomethylethylamine	57.4%
methyl methanesulfonate	49.6%
n-nitrosodiethylamine	70.3%
ethyl methanesulfonate	50.5%
2-picoline	43.5%
acetophenone	60.9%
n-nitrosopyrrolidine	73.4%
n-nitrosomorpholine	59.6%
o-toluidine	58.0%
o,o,o-triethyl phosphorothionate	52.1%
1-nitroso-piperidine	60.0%
n-nitroso-di-n-butylamine	61.8%
safrole	43.3%

isosafrole	40.3%
1,4-napthaquinone	40.2%
1,3-dinitrobenzene	42.0%
1-naphthylamine	49.3%
2-naphthylamine	47.8%
thionazin	68.0%
phorate	59.9%
phenacetin	59.1%
diallate	64.9%
dimethoate	78.1%
4-aminobiphenyl	45.4%
pronamide	49.4%
pentachloronitrobenzene	82.3%
disulfoton	55.4%
methyl parathion	71.6%
parathion	75.6%
methapyrilene	99.6%
isodrin	61.1%
chlorobenzilate	73.1%
3,3'-dimethylbenzidine	110%
famphur	188%
2-acetylaminofluorene	66.7%
m-cresol	47.4%
4-nitroquinoline-1-oxide	39.3%
diphenylamine	41.9%
kepone	58.8%
7,12-dimethylbenz(a)anthracene	47.7%
a,a-dimethylphenethylamine	31.4%
1,3,5-trinitrobenzene	32.7%
hexachlorophene	68.3%

The results for these compounds in associated samples 578CB00401 and 578CB00401RE, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

TIC's:

There were no TIC detections in the method blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG fraction. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 578CB00401 and 578SB00401 (analyzed in SDG 25630B) since all positive compound results were below the CRQL. These results were flagged by the laboratory as estimated (J). No further action was required.

IX.) Internal Standards Performance (ISTD's):

The Percent Recoveries (%R's) of 1,4-dichlorobenzene-d4 (220%), naphthalene-d8 (215%), acenaphthene (209%), phenanthrene-d10 (211%) and perylene-d12 (201%) exceeded the 50-200% QC limit for sample 578CB00401. All positive results for the compounds in this sample quantitated on these ISTD's were flagged as estimated (J).

The Percent Recoveries (%R's) of chrysene-d12 (208%) and perlyene-d12 (212%) exceeded the 50-200% QC limits for sample 578CB00401RE. All positive results for the compounds quantitated on these ISTD's were flagged as estimated (J).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The reanalysis of sample 578CB00401 was considered by the validator to be of preferable data quality to the original analysis due to improved internal standard performance. The non-detect results for aramite in samples 578CB00401 and 578CB00401RE were rejected due to low Relative Response Factors in the initial calibration. All other laboratory data were acceptable with qualifications.

## *ORGANOPHOSPHORUS PESTICIDES*

### I.) Holding Times:

All Holding Time criteria were met, so no action was required.

### II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

### III.) Calibration:

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

### IV.) Blanks:

#### Method Blanks:

There were no positive detections in the method blank. No action was required.

### V.) Surrogate Recoveries:

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

### VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses for this fraction. No action was taken.

### VIII.) Field Duplicates:

There were no field duplicate samples for this fraction of the SDG. No action was taken.

### IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

### X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*CHLORINATED HERBICIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

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

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

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

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL METALS*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

The following blank result represents the highest detection associated with the samples:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max Conc.</u>	<u>Action Level</u>
PBS1	sodium	21.68 mg/kg	108 mg/kg

PBS = Preparation Blank (Soil)

The associated positive sample result for sodium was greater than 5X the blank amount. No action was required.

IV.) ICP Interference Check Sample Results:

All ICP Interference criteria were met, so no action was taken.

V.) ICP Serial Dilution Analysis:

Serial Dilution analysis was not performed for this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analyses was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

Matrix Spikes were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Sample 578CB00401 was analyzed in this SDG, while corresponding duplicate sample 578SB00401 was analyzed in SDG 25630B. The calculable Relative Percent Differences were:

<u>Analyte</u>	<u>578SB00401, mg/kg</u>	<u>578CB00401, mg/kg</u>	<u>RPD</u>
aluminum	3960	3830	3.3
arsenic	1.7	1.5	12.5
calcium	8550	1230	150
chromium	4.1	4.0	24
cobalt	31.3	37.8	19
copper	5.8	4.0	36
iron	4280	4140	3.3
lead	22	14.5	41
magnesium	591	264	76
manganese	44.2	37.5	16
mercury	0.12	0.10	18
nickel	3.6	6.0	50
zinc	28.9	29.7	2.7

The RPD's for calcium and magnesium exceeded the 60% QC limit for soil samples. The positive results for these two analytes in the two duplicate samples were flagged as estimated (J).

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. 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:

All laboratory data were acceptable with qualifications.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 25630B Level III, CLP Organics and Inorganics

SAMPLES: 578SB00101, 578SB00102, 578SB00201, 578SB00201RE, 578SB00202, 578SB00301, 578SB00301DL, 578SB00302, 578SB00401, 578SB00401RE, 578SB00402, 578SB00501, 578SB00502, 578SB00601, 578SB00602, 578TB00602, 578SB00401MS, 578SB00401MSD, 578SB00601MS, 578SB00601MD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC/MS Tuning:

All GC/MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/01/96 on instrument C for the following compounds:

chloromethane	31.2%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%

All positive results for acetone in the soil samples in this SDG were flagged as estimated (J). The other compounds were not detected in the associated samples, so no further action was necessary.

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 5/08/96 on instrument U for bromomethane (35.3%). Since the only associated sample was a field blank, no action was required.

##### Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.048) was below the 0.050 QC limit for the standards run on 5/23/96 at 10:36 on instrument C. All results for this compound in associated samples 578SB00101, 578SB00102, 578SB00201, 578SB00201RE, 578SB00301, 578SB00302, 578SB00401, 578SB00402, 578SB00501, 578SB00502 and 578SB00602, which consisted entirely of non-detects, were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 5/23/96 at 10:36 on instrument C for the following compounds:

2-chloroethyl vinyl ether	56.8%
bromomethane	27.4%
chloroethane	33.5%

The results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. The results for the other compounds in associated samples 578SB00101, 578SB00102, 578SB00201, 578SB00202, 578SB00201RE, 578SB00301, 578SB00302, 578SB00401, 578SB00402, 578SB00501, 578SB00502 and 578SB00602, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.041) was below the 0.050 QC limit for the standard run on 5/24/96 at 12:21 on instrument C. All results for this compound in associated samples 578SB00401RE, 578SB00601 and 578SB00301DL, which consisted entirely of non-detects, were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 5/24/96 at 12:21 on instrument C for the following compounds:

2-chloroethyl vinyl ether	63.1%
chloroethane	25.7%
vinyl acetate	40.7%

The results for chloroethane and vinyl acetate in associated samples 578SB00401RE, 578SB00601 and 578SB00301DL, which consisted entirely of non-detects, were flagged as estimated (UJ). The results for 2-chloroethyl vinyl ether were previously rejected. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 5/21/96 at 11:51 on instrument U for the following compounds:

chloromethane	25.0%
acetone	31.2%
carbon disulfide	26.5%

Since the only associated sample was a trip blank, no action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks for this SDG. No action was required.

Trip Blank:

There were no positive detections in the trip blank in this SDG. No action was required.

TIC's:

All TIC criteria were met, so no action was taken.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of toluene (153%) and bromofluorobenzene (43%) were outside their 81-117% and 74-121% QC limits, respectively, for sample 578SB00201. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) of toluene (179%) and bromofluorobenzene (42%) were outside their 81-117% and 74-121% QC limits, respectively, for sample 578SB00301. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) of toluene (150%) and bromofluorobenzene (46%) were outside their 81-117% and 74-121% QC limits, respectively, for sample 578SB00401. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

The Percent Recovery (%R) of toluene (125%) exceeded the 81-117% QC limits for sample 578SB00201RE. All positive results for this sample were flagged as estimated (J).

The Percent Recoveries (%R's) of toluene (147%) and bromofluorobenzene (44%) were outside their 81-117% and 74-121% QC limits, respectively, for sample 578SB00401RE. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) of toluene (183%) and bromofluorobenzene (40%) were outside their 81-117% and 74-121% QC limits, respectively, for sample 578SB00301DL. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

The Percent Recovery (%R) of bromofluorobenzene (71%) was below the 74-121% QC limits for sample 578SB00601. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD's were not analyzed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

The Relative Percent Difference (RPD) for methylene chloride in field duplicate samples 578SB00401 and 578CB00401 (analyzed in SDG 25630A) was 11%, which was within the 60% QC limit for soil samples. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of bromochloromethane (36%), 1,4-difluorobenzene (23%) and chlorobenzene-d5 (11%) were below the 50-200% QC limits for sample 578SB00201. All positive and non-detect results for the compounds quantitated on bromochloromethane were flagged as estimated (J) and (UJ). All positive results for the compounds quantitated on the other two ISTD's were flagged as estimated (J) and all non-detect results were rejected (R), since their %R's were less than 25%.

The Percent Recoveries (%R's) of bromochloromethane (38%), 1,4-difluorobenzene (18%) and chlorobenzene-d5 (8.6%) were below the 50-200% QC limits for sample 578SB00301. All positive and non-detect results for the compounds quantitated on bromochloromethane were flagged as estimated (J) and (UJ). Results for the compounds quantitated on the other two ISTD's, which consisted entirely of non-detects, were rejected (R), since their %R's were less than 25%.

The Percent Recoveries (%R's) of 1,4-difluorobenzene (43%) and chlorobenzene-d5 (23%) were both below the 50-200% QC limits for sample 578SB00401. All positive and non-detect results for the compounds quantitated on 1,4-difluorobenzene were flagged as estimated (J) and (UJ). Results for the compounds quantitated on the other ISTD, which consisted entirely of non-detects, were rejected (R) since the %R was less than 25%.

The Percent Recoveries (%R's) of bromochloromethane (49%), 1,4-difluorobenzene (44%) and chlorobenzene-d5 (35%) were below the 50-200% QC limits for sample 578SB00201RE. All positive and non-detect results for the compounds in this sample were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) of bromochloromethane (41%), 1,4-difluorobenzene (30%) and chlorobenzene-d5 (16%) were below the 50-200% QC limits for sample 578SB00401RE. All positive and non-detect results for the compounds quantitated on bromochloromethane and 1,4-difluorobenzene were flagged as estimated (J) and (UJ). Results for the compounds quantitated on the other ISTD, which consisted entirely of non-detects, were rejected (R) since the %R was less than 25%.

The Percent Recoveries (%R's) of 1,4-difluorobenzene (40%) and chlorobenzene-d5 (15%) were both below the 50-200% QC limits for sample 578SB00301DL. Results for the compounds quantitated on 1,4-difluorobenzene, which consisted entirely of non-detects, were flagged as estimated (UJ). Results for the compounds quantitated on the other ISTD, which consisted entirely of non-detects, were rejected (R) since the %R was less than 25%.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample 578SB00401 was considered by the validator to be of preferable data quality to the reanalysis due to its better holding time. The reanalysis of sample 578SB00201 was considered by the validator to be of preferable data quality to the original analysis due to improved internal standard performance. Sample 578SB00301 was reanalyzed only as a dilution (578SB00301DL). The dilution analysis was considered by the validator to be of preferable data quality to the original analysis due to improved internal standard performance and, consequently, fewer rejected data points.

All results for 2-chloroethyl vinyl ether, which consisted entirely of non-detects, in the soil samples for this SDG were rejected (R) due to low RRF's in the continuing calibrations. All non-detect results quantitated on internal standards 1,4-difluorobenzene in two samples and chlorobenzene in five samples were rejected due to very low (less than 25%) recoveries. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

Butylbenzylphthalate was detected at 41.0 ug/kg in method blank SBLK1. All positive results for this compound in the soil samples in this SDG, less than 10X the blank amount were flagged as undetected (U) with the analytical results less than the CRQL being raised to the CRQL.

TIC's:

All TIC criteria were met, so no action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 578CB00401 and 578SB00401 (analyzed in SDG 25630B) since all positive compound results were below the CRQL. These results were flagged by the laboratory as estimated (J). No further action was required.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

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

III.) Blanks:

The following blank result represents the highest detection associated with the samples:

<u>Blank1</u> <u>Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
PBS1	sodium	21.68 mg/kg	108 mg/kg

All associated sample results were greater than 5X the blank amount. No action was required.

IV.) ICP Interference Check Sample Results:

All ICP Interference criteria were met, so no action was taken.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All criteria were met for matrix duplicate sample 578SB00601MD. No action was required.

VIII.) Matrix Spike (MS):

The Percent Recoveries (%R's) of antimony (69.7%) and zinc (67.2%) were below the 75-125% QC limit for spiked sample 578SB00601MS. All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Sample 578SB00401 was analyzed in this SDG, while corresponding duplicate sample 578CB00401 was analyzed in SDG 25630A. The calculable Relative Percent Differences were:

Analyte	578SB00401, mg/kg	578CB00401, mg/kg	RPD
aluminum	3960	3830	3.3
arsenic	1.7	1.5	12.5
calcium	8550	1230	150
chromium	4.1	4.0	24
cobalt	31.3	37.8	19
copper	5.8	4.0	36
iron	4280	4140	3.3
lead	22	14.5	41
magnesium	591	264	76
manganese	44.2	37.5	16
mercury	0.12	0.10	18
nickel	3.6	6.0	50
zinc	28.9	29.7	2.7

The RPD's for calcium and magnesium exceeded the 60% QC limit for soil samples. The positive results for these two analytes in the two duplicate samples were flagged as estimated (J).

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:

All laboratory data were acceptable with qualifications.

*pH*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Blank analysis is not a requirement for pH determinations. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not required for this fraction of the SDG. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

# VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

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## DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall  
SITE NAME: Charleston Navel Base, Zone E  
PROJECT NUMBER: 8500.14  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRICES: Soil and Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides / PCB's, Total Metals and Cyanide, Diesel Range Organics, Gasoline Range Organics  
SDG NUMBERS: 25657A (Appendix IX, Level IV)  
25657B (Level III)

### SAMPLES:

SDG 25657A (Level IV):

Client	Lab	Matrix	Semi-volatiles	Pesticides/ PCB's	Metals/ Cyanide
<u>Sample #</u>	<u>Sample #</u>				
102CB03601*	25658.01	Soil	X	X	X
102CB03601DL	25658.01DL	Soil		X	
102CB04101*	25680.01	Soil	X	X	X

\* = Field duplicates were associated with samples 102SB03601 and 102SB04101 in SDG 25657B. The Total Metals results for these samples were reported on the level III spreadsheets.

C = FIELD DUPLICATE, DL = DILUTION

SDG 25657B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
102SB03401	25657.01	Soil		X	X	X
102SB03401DL	25657.01DL	Soil			X	
102SB03501	25657.02	Soil		X	X	X
102SB03501RE	25657.02RE	Soil		X		
102SB03601	25657.03	Soil		X	X	X
102SB03601DL	25657.03DL	Soil			X	
102SB03601RE	25657.03RE	Soil		X		
102SB03701	25657.04	Soil		X	X	X
102SB03701DL	25657.04DL	Soil		X	X	
102SB03801	25657.05	Soil		X	X	X
102SB03801DL	25657.05DL	Soil			X	
102SB03801RE	25657.05RE	Soil		X		
102SB03901	25657.06	Soil		X	X	X
102SB03901RE	25657.06RE	Soil		X		
102SB03902	25657.07	Soil		X	X	X
102SB03902RE	25657.07RE	Soil		X		
102DB04001	25679.07	Soil		X	X	X
102SB04002	25679.08	Soil		X	X	X
102SB04002RE	25679.08RE	Soil		X		
102SB04101	25679.05	Soil		X	X	X
102SB04102	25679.06	Soil		X	X	X
102SB04201	25679.01	Soil		X	X	X
102SB04201RE	25679.01RE	Soil		X		
102SB04202	25679.02	Soil		X	X	X
102DB04201	25679.10	Water	X	X	X	X
102EB04201	25679.09	Water	X	X	X	X
102TB04201	25679.11	Water	X			
102SB04202MS	25679.02MS	Soil		+	+	+
102SB04202MD	25679.02MD	Soil				+
102SB04202MSD	25679.02MSD	Soil		+	+	

Client Sample #	Lab Sample #	Matrix	Diesel Range Organics	Gasoline Range Organics
102SB04001	25679.07	Soil	X	X
102SB04002	25679.08	Soil	X	X

\* = Non-billable QC samples, DB = DEIONIZED WATER BLANK, DL = DILUTION, EB = EQUIPMENT RINSATE BLANK, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, T = TRIP BLANK

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

RELEASE SIGNATURE: 

### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 25657A Appendix IX, CLP Organics and Inorganics

SAMPLES: 102CB03601, 102CB03601DL, 102CB04101

### *SEMIVOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met. No action was required.

#### II.) GC/MS Tuning:

All GC/MS Tuning criteria were met, so no action was taken.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factor (RRF) for aramite (0.030) was below the 0.050 QC limit for the standards analyzed on 5/08/96 on instrument A. The results for this compound in associated samples 102CB03601 and 102CB04101, which were both non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 5/08/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
n-nitrosomorpholine	33.4%
o-toluidine	37.3%
1-nitroso-piperidine	35.0%
o,o,o-triethyl phosphorothionate	35.1%
2,6-dichlorophenol	33.6%
hexachloropropene	32.8%
n-nitroso-di-n-butylamine	32.9%
1,2,4,5-tetrachlorobenzene	34.7%
isosafrole	32.8%
1,4-napthaquinone	35.4%

1,3-dinitrobenzene	35.1%
1-naphthylamine	37.8%
4-nitroquinoline-1-oxide	39.5%
2-naphthylamine	35.1%
thionazin	36.9%
2-methyl-5-nitroaniline	35.7%
diphenylamine	31.5%
sulfotepp	35.8%
phorate	36.4%
phenacetin	33.3%
diallate	35.0%
dimethoate	37.6%
4-aminobiphenyl	32.0%
pronamide	37.5%
pentachloronitrobenzene	45.3%
disulfoton	37.7%
methyl parathion	36.4%
parathion	37.4%
methapyrilene	44.3%
isodrin	35.3%
chlorobenzilate	39.3%
3,3'-dimethylbenzidine	43.5%
kepone	32.0%
famphur	70.0%
2-acetylaminofluorene	35.4%
7,12-dimethylbenz(a)anthracene	47.9%

These compounds were not detected in the two associated samples. No action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.044), methapyrilene (0.020) and hexachlorophene (0.023) were below the 0.050 QC limit for the standards analyzed on 6/06/96 on instrument A. The non-detect results for aramite were previously rejected based on the initial calibration. The results for the other two compounds in samples 102CB03601 and 102CB04101, which consisted entirely of non-detects, were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/06/96 at 11:13 on instrument A for the following compounds:

2,6-dichlorophenol	50.1%
hexachloropropene	101%
1,2,4,5-tetrachlorobenzene	35.6%
hexachlorocyclopentadiene	55.5%
pentachlorobenzene	55.7%
methapyrilene	81.4%
aramite	47.5%
methyl methanesulfonate	49.1%

n-nitrosodiethylamine	66.2%
ethyl methanesulfonate	49.1%
2-picoline	57.1%
acetophenone	71.5%
n-nitrosopyrrolidine	69.9%
n-nitrosomorpholine	62.1%
o-toluidine	59.9%
o,o,o-tricethyl phosphorothionate	48.5%
1-nitrosopiperidine	60.0%
n-nitroso-di-n-butylamine	52.1%
safrole	47.2%
isosafrole	33.4%
1,3-dinitrobenzene	44.1%
1,4-napthoquinone	58.4%
1-napthylamine	58.4%
2-napthylamine	52.2%
thionazin	61.9%
phorate	56.8%
phenacetin	50.4%
diallate	35.9%
dimethoate	74.6%
4-aminobiphenyl	43.7%
pronamide	53.7%
pentachloronitrobenzene	67.9%
disulfoton	46.9%
methyl parathion	73.0%
parathion	89.8%
isodrin	65.2%
chlorobenzilate	90.9%
3,3'-dimethylbenzidine	124%
famphur	244%
2-acetylaminofluorene	80.3%
pyridine	33.4%
m-cresol	42.6%
4-nitroquinoline-1-oxide	89.5%
diphenylamine	39.8%
sulfotep	29.2%
kepone	64.5%
7,12-dimethylbenz(a)anthracene	129%
a,a-dimethylphenethylamine	39.6%
1,3,5-trinitrobenzene	72.9%
hexachlorophene	52.0%

The results for aramite, methapyrilene and hexachlorophene in the samples for this SDG were previously rejected because of low RRF's in this calibration. The results for the other compounds in associated samples 102CB03601 and 102CB04101, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks associated with this SDG. No action was required.

Field Blanks:

There were no positive detections in the deionized water and equipment rinsate blanks associated with this SDG, which were analyzed in SDG 25657B. No action was required.

TIC's:

There were no TIC detections in the method or field blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG fraction. No action was necessary.

VIII.) Field Duplicates:

The calculable Relative Percent Differences (RPD's) for field duplicate sample sets 102CB03601 / 102SB04101 and 102SB03601 / 102CB04101 were:

<u>Compound</u>	<u>102SB03601</u>	<u>102CB03601</u>	<u>RPD</u>
acenaphthylene	550	490	11
phenanthrene	520	380	31
anthracene	380	320	17
fluoranthene	1700	2200	25
pyrene	4800	4500	6.4
chrysene	2700	2600	3.8
benzo(b)fluoranthene	4000	3800	5.1
benzo(k)fluoranthene	4000	3100	25
benzo(a)pyrene	2900	2700	7.1
indeno(1,2,3-cd)pyrene	2500	2100	17
dibenz(a,h)anthracene	1400	960	37
benzo(g,h,i)perylene	3000	2200	31

<u>Compound</u> naphthalene	<u>102SB04101</u> 180	<u>102CB04101</u> 200	<u>RPD</u> 10.5
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All RPD's were within the 60% QC limit for soil samples. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite, methapyrilene and hexachlorophene in samples 102CB03601 and 102CB04101 were rejected due to low Relative Response Factors in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*PESTICIDES / PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/06/96 at 20:59 on the primary column for heptachlor (30.1%), endosulfan I (29.2%), endrin (41.1%), 4,4'-DDT (94.7%) and methoxychlor (85.9%). All positive and non-detect results for these compounds in associated samples 102CB03601 and 102CB04101 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/06/96 at 21:29 on the primary column for endosulfan sulfate (41.1%), endrin ketone (54.6%) and endrin aldehyde (36.6%). All positive and non-detect results for these compounds in associated samples 102CB03601 and 102CB04101 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 6/06/96 at 20:59 on the secondary column for heptachlor (33.5%), endrin (31.8%), 4,4'-DDT (90.2%) and methoxychlor (73.1%). All positive and non-detect results for these compounds in associated samples 102CB03601 and 102CB04101 were previously flagged as estimated. No further action was necessary.

The Percent Difference (%D) exceeded the 25% QC limit for the standards run on 6/06/96 at 21:29 on the secondary column for endrin ketone (30.0%). The results for this compound in the associated samples were previously flagged. No further action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was required.

Deionized and Equipment Rinsate Blanks:

There were no positive detections in the field blanks associated with this SDG, which were analyzed in SDG 25657B. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of surrogate decachlorobiphenyl (DCB) were above the 30-150% QC limits for the following samples:

Client Sample #:	DCB, %R Column 1	DCB, %R Column 2
102CB03601	162	161
102CB03601DL	853	295

All positive results for samples 102CB03601 and 102CB03601DL were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 102CB04101 and 102SB04101 (analyzed in SDG 25657B). No action was taken.

The calculable Relative Percent Differences (RPD's) for field duplicate samples 102CB03601 and 102SB03601 (analyzed in SDG 25657B) were:

<u>Compound</u>	<u>102SB03601</u>	<u>102CB03601</u>	<u>RPD</u>
heptachlor epoxide	2.4	2.2	8.7
4,4'-DDE	28	27	3.6
4,4'-DDD	3.8	24	145
4,4'-DDT	150	140	6.9
alpha chlordane	5.8	4.2	32
gamma chlordane	30	26	14

The RPD for 4,4'-DDD exceeded the 60% QC limits for soil samples. The positive results for this compound in the two samples were flagged as estimated (J).

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

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

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max Conc.</u>	<u>Action Level</u>
ERB	aluminum	107 ug/L	107 mg/kg
CCB4	antimony	4.3 ug/L	4.30 mg/kg
ERB	barium	162 ug/L	162 mg/kg
ERB	calcium	2310 ug/L	2310 mg/kg
PBW	chromium	1.90 ug/L	1.90 mg/kg
ERB	iron	68.8 ug/L	68.8 mg/kg
ERB	magnesium	286 ug/L	286 mg/kg
ERB	manganese	13.9 ug/L	13.9 mg/kg
DWB	potassium	2080 ug/L	2080 mg/kg
ERB	sodium	27500 ug/L	27500 mg/kg
ERB	vanadium	2.10 ug/L	2.10 mg/kg
ERB	zinc	11.4 ug/L	11.4 mg/kg

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank (102DB04201),  
ERB = Equipment Rinsate Blank (102EB04201), PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration, preparation blank, deionized water or equipment rinsate blank were flagged as undetected (U).

IV.) ICP Interference Check Sample Results (ICS):

All ICS criteria were met, so no action was taken.

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) exceeded the 10% QC limit for calcium (11.2%), iron (19.3%) and manganese (124%) for serial dilution sample 102CB03601L. All positive results for these analytes in the associated soil samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Differences (RPD's) for calcium (61.0%) and manganese (52.4%) exceeded the 35% QC limit for associated matrix duplicate sample 102SB04202 (analyzed in SDG 25657B). All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike (MS):

The Percent Recoveries (%R's) of antimony (40.1%) and mercury (27.0%) were below the 75-125% QC limit for associated spiked sample 102SB04202MS (analyzed in SDG 25657B). All positive and non-detect results for antimony in the associated soil samples were flagged as estimated (J) and (UJ). All results for mercury, which consisted entirely of positive concentrations, were flagged as estimated (J).

IX.) Field Duplicates:

Field duplicate samples 102CB03601 and 102CB04101 were analyzed in this SDG, while corresponding samples 102SB03601 and 102SB04101 were analyzed in SDG 25657B. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>102SB03601, mg/kg</u>	<u>102CB03601, mg/kg</u>	<u>RPD</u>
aluminum	6560	5390	19
arsenic	25	26.6	6.2
beryllium	0.53	0.40	28
cadmium	0.73	0.58	23
calcium	52800	54300	2.8
chromium	23.9	20.8	14
cobalt	69.8	57.5	19
copper	73.8	75.7	2.5
iron	9000	9720	7.6
lead	242	339	33
manganese	118	99.7	17
mercury	1.8	1.2	40
nickel	22.8	17.7	25
silver	0.25	1.8	151
vanadium	18.7	16	16
zinc	284	253	11
tin	8.6	6.3	31
cyanide	1.2	1.1	8.7

<u>Analyte</u>	<u>102SB04101, mg/kg</u>	<u>102CB04101, mg/kg</u>	<u>RPD</u>
aluminum	6000	4150	36
arsenic	2.6	1.3	67
chromium	97	197	68
cobalt	24.6	28	13
copper	6.5	2.1	102

<u>Analyte</u>	<u>102SB04101, mg/kg</u>	<u>102CB04101, mg/kg</u>	<u>RPD</u>
iron	4030	2230	57
lead	15	5.4	94
magnesium	4220	5140	19.6
mercury	0.11	0.05	75
nickel	4.6	4.4	4.4
vanadium	10	6	50

The results for all analytes with RPD's exceeding the 60% QC limit for soil samples in these four samples were flagged as estimated (J).

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. 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:

All laboratory data were acceptable with qualifications.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 25657B Level III, CLP Organics and Inorganics

SAMPLES: 102SB03401, 102SB03401DL, 102SB03501, 102SB03501RE, 102SB03601, 102SB03601DL, 102SB03601RE, 102SB03701, 102SB03701DL, 102SB03801, 102SB03801DL, 102SB03801RE, 102SB03901, 102SB03901RE, 102SB03902, 102SB03902RE, 102SB04001, 102SB04002, 102SB04002RE, 102SB04101, 102SB04102, 102SB04201, 102SB04201RE, 102SB04202, 102DB04201, 102EB04201, 102TB04201, 102SB04202MS, 102SB04202MD, 102SB04202MSD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The Average Relative Responesen Factor (RRF) for 2-chloroethyl vinyl ether (0.046) was below the 0.050 QC limit for the standards analyzed on 4/29/96 on instrument R. The results for this compound in associated blanks 102DB04201, 102EB04201 and 102TB04201, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 4/29/96 on instrument R for the following compounds:

chloromethane	33.9%
bromomethane	39.4%
chloroethane	40.6%
methylene chloride	34.9%
acetone	75.1%
carbon disulfide	34.8%
1,2-dichloroethene	30.2%
1,2-dichloroethane	30.7%
2-butanone	39.1%
trans-1,2-dihloroethene	30.2%

Since the associated samples were field blanks, no action was required.

#### Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.029) was below the 0.050 QC limit for the standards analyzed on 5/23/96 at 09:51 on instrument R. All results for this compound in the associated blanks were previously rejected based on the initial calibration. No action was required.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 5/23/96 at 09:51 on instrument R for 2-chloroethyl vinyl ether (37.0%). No action was necessary, since the associated samples were field blanks.

#### IV.) Blanks:

##### Method Blanks:

Methylene chloride was detected at 1.0 ug/L in method blank VBLK1. Since the associated samples were field blanks, no action was required.

##### TIC's:

All TIC criteria were met, so no action was taken.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

#### VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was necessary.

#### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD's were not analyzed for this fraction of the SDG. No action was required.

#### VIII.) Field Duplicates:

There were no field duplicate samples for this fraction of the SDG. No action was required.

#### IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

#### X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for 2-chloroethyl vinyl ether in all samples in this SDG were rejected (R) due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) for benzoic acid (31.4%) exceeded the 30% QC limit for the standards analyzed on 6/04/96 on instrument J. All positive results for this compound in the associated samples were flagged as estimated (J).

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/05/96 at 09:55 on instrument J for benzoic acid (39.2%) and 2,4-dinitrophenol (34.6%). All positive and non-detect results for these compounds in associated samples 102SB03401, 102SB03501, 102SB03501RE, 102SB03601, 102SB03601RE, 102SB03701, 102SB03701DL, 102SB03801, 102SB03801RE, 102SB03901, 102SB03901RE, 102SB03902, 102SB03902RE, 102SB04001, 102SB04002RE and 102SB04102 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 5/30/96 at 11:01 on instrument M for the following compounds:

benzoic acid	34.5%
2-methylnapthalene	27.1%
2,4-dinitrophenol	52.3%
4,6-dinitro-2-methylphenol	39.8%
3,3'-dichlorobenzidine	40.6%
benzo(k)fluoranthene	31.8%
indeno(1,2,3-cd)pyrene	42.2%

No action was taken, since the associated samples were field blanks.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/03/96 at 07:51 on instrument V for 3,3'-dichlorobenzidine (35.1%) and benzo(g,h,i)perylene (29.0%). The results for these compounds in associated sample 102SB04201 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/04/96 at 08:38 on instrument V for the following compounds:

benzoic acid	46.2%
2,4-dinitrophenol	26.1%
3,3'-dichlorobenzidine	82.4%
indeno(1,2,3-cd)pyrene	30.5%
dibenz(a,h)anthracene	28.9%

All positive and non-detect results for these compounds in associated samples 102SB04002, 102SB04101, 102SB04201RE and 102SB04202 were flagged as estimated (J) and (UJ).

#### IV.) Blanks:

##### Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 1.0 ug/L in method blank SBLK1. Since the associated samples were field blanks, no action was required.

##### Field Blanks:

There were no positive detections in the field blanks associated with this SDG. No action was required.

##### TIC's:

All TIC criteria were met, so no action was necessary.

#### V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of 2-fluorophenol exceeded the 25-121% QC limits for the following samples:

<u>Client Sample ID</u>	<u>%R</u>
102SB03401	130
102SB03601	128
102SB03701	125
102SB03801	129

Since only one surrogate %R exceeded the QC limits for the base/neutral fraction of these samples, no action was necessary.

The Percent Recoveries (%R's) of terphenyl-d14 exceeded the 18-137% QC limits for the following samples:

<u>Client Sample ID</u>	<u>%R</u>
102SB03601RE	139
102SB03801RE	143

Since only one surrogate %R exceeded the QC limits for the base/neutral fraction of these samples, no action was necessary.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed with this SDG. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of 2,4-dinitrotoluene exceeded the 28-89% QC limits for samples 102SB04202MS (90%) and 102SB04202MSD (90%). Since this compound was not detected in unspiked sample 102SB04202, no action was required.

VIII.) Field Duplicates:

The calculable Relative Percent Differences (RPD's) for field duplicate sample sets 102SB03601 / 102CB03601 and 102SB04101 / 102CB04101 were:

<u>Compound</u>	<u>102SB03601</u>	<u>102CB03601</u>	<u>RPD</u>
acenaphthylene	550	490	11
phenanthrene	520	380	31
anthracene	380	320	17
fluoranthene	1700	2200	25
pyrene	4800	4500	6.4
chrysene	2700	2600	3.8
benzo(b)fluoranthene	4000	3800	5.1
benzo(k)fluoranthene	4000	3100	25
benzo(a)pyrene	2900	2700	7.1
indeno(1,2,3-cd)pyrene	2500	2100	17
dibenz(a,h)anthracene	1400	960	37
benzo(g,h,i)perylene	3000	2200	31

<u>Compound</u>	<u>102SB04101</u>	<u>102CB04101</u>	<u>RPD</u>
naphthalene	180	200	10.5

All RPD's were within the 60% QC limit for soil samples. No action was required.

IX.) Internal Standards Performance (ISTD's):

The ISTD Percent Recoveries (%R's) were below the 50-200% QC limits for the following samples:

<u>Client Sample #</u>	<u>ISTD</u>	<u>%R</u>
102SB03501	perylene-d12	40
102SB03601	perylene-d12	46
102SB03701	perylene-d12	43
102SB03801	perylene-d12	42
102SB03901	perylene-d12	48
102SB03902	perylene-d12	49
102SB04201	chrysene-d12	37
	perylene-d12	24
102SB04002	perylene-d12	35
102SB03501RE	chrysene-d12	42
	perylene-d12	38
102SB03601RE	perylene-d12	43
102SB03701DL	chrysene-d12	36
	perylene-d12	30
102SB03801RE	chrysene-d12	37
	perylene-d12	30
102SB03901RE	chrysene-d12	31
	perylene-d12	27
102SB03902RE	chrysene-d12	30
	perylene-d12	25
102SB04201RE	perylene-d12	44
102SB04002RE	perylene-d12	48

All positive results for the compounds associated with perylene-d12 in sample 102SB04201 were flagged as estimated (J) and all non-detect results were rejected (R), since the %R was less than 25%. All positive and non-detect results for the compounds associated with the other ISTD's in the other samples were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 102SB03501, 102SB03601, 102SB03801, 102SB03901, 102SB03902 and 102SB04002 were considered by the validator to be of preferable data quality to the reanalysis because of better ISTD performances. The reanalysis of sample 102SB04201 was considered by the validator to be of preferable data quality to the original analysis because of improved ISTD performance criteria.

All non-detects results for compounds quantitated on ISTD perylene-d12 in sample 102SB04201 were rejected because of a very low ISTD %R. All laboratory data were acceptable with qualifications.

*PESTICIDES / PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Breakdown of endrin (28.8%) exceeded the 20% QC limit for the standard analyzed on 5/24/96 at 12:49 on the primary column. Since the associated samples were field blanks, no action was required.

The Relative Percent Differences (RPD's) exceeded the 25% QC limit for the standards analyzed on 5/25/96 at 01:30 on the primary column for alpha-BHC (25.2%), gamma-BHC (26.0%), 4,4'-DDT (35.3%) and methoxychlor (28.8%). The associated samples were field blanks. No action was taken.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 5/24/96 at 19:25 on the primary column for heptachlor (25.7%) and 4,4'-DDT (26.4%). Since the associated samples were field blanks, no action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 5/25/96 at 02:30 on the primary column for heptachlor (32.3%), 4,4'-DDT (37.5%) and methoxychlor (29.5%). Since the associated samples were field blanks, no action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 5/25/96 at 03:01 on the primary column for delta-BHC (25.4%), endrin ketone (30.6%) and endrin aldehyde (31.7%). Since the associated samples were field blanks, no action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/06/96 at 20:59 on the primary column for heptachlor (30.1%), endosulfan I (29.2%), endrin (41.1%), 4,4'-DDT (94.7%) and methoxychlor (85.9%). All positive and non-detect results for these compounds in associated samples 102SB03401, 102SB03501, 102SB03601, 102SB03701, 102SB03801, 102SB03901 and 102SB03902 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/06/96 at 21:29 on the primary column for endosulfan sulfate (41.1%), endrin ketone (54.6%) and endrin aldehyde (36.6%). All positive and non-detect results for these compounds in associated samples 102SB03401, 102SB03501, 102SB03601, 102SB03701, 102SB03801, 102SB03901 and 102SB03902 were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/07/96 at 16:59 on the primary column for 4,4'-DDT (40.6%). All positive and non-detect results for this compound in associated samples 102SB03701DL, 102SB03801DL, 102SB04201, 102SB04202, 102SB04101, 102SB04102, 102SB04001 and 102SB04002 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/06/96 at 20:59 on the secondary column for heptachlor (33.5%), endrin (31.8%), 4,4'-DDT (90.2%) and methoxychlor (73.1%). All positive and non-detect results for these compounds in the associated samples were previously flagged as estimated. No further action was necessary.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/06/96 at 21:29 on the secondary column for endrin ketone (30.0%). The results for this compound in the associated samples were previously flagged. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/07/96 at 16:59 on the secondary column for 4,4'-DDT (46.2%) and methoxychlor (30.2%). The results for 4,4'-DDT in the associated samples were previously flagged. All positive and non-detect results for methoxychlor in associated samples 102SB03701DL, 102SB03801DL, 102SB04201, 102SB04202, 102SB04101, 102SB04102, 102SB04001 and 102SB04002 were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/07/96 at 17:28 on the secondary column for endrin aldehyde (47.3%). All positive and non-detect results for this compound in associated samples 102SB03701DL, 102SB03801DL, 102SB04201, 102SB04202, 102SB04101, 102SB04102, 102SB04001 and 102SB04002 were flagged as estimated (J) and (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in the deionized water and equipment rinsate blanks in this SDG. No action was required.

V.) Surrogate Recoveries:

The Surrogate Percent Recoveries (%R's) were above the 30-150% QC limits for the following samples:

Client Sample ID	TCX, %R Column 1	TCX, %R Column 2	DCB, %R Column 1	DCB, %R Column 2
102SB03401			436	712
102SB03601				193
102SB03701			515	198
102SB03801		188	217	351
102SB03401DL			112	738
102SB03601DL			1024	321
102SB03701DL			2609	512
102SB03801DL			2441	438
102SB04201			162	

All positive results for these samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

Five LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 102SB04101 and 102CB04101 (analyzed in SDG 25657A). No action was taken.

The calculable RPD's for field duplicate samples 102SB03601 and 102CB03601 (analyzed in SDG 25657A) were:

<u>Compound</u>	<u>102SB03601</u>	<u>102CB03601</u>	<u>RPD</u>
heptachlor epoxide	2.4	2.2	8.7
4,4'-DDE	28	27	3.6
4,4'-DDD	3.8	24	145
4,4'-DDT	150	140	6.9
alpha chlordane	5.8	4.2	32
gamma chlordane	30	26	14

The results for 4,4'-DDD in the two samples were flagged as estimated (J) because the RPD exceeded the 60% QC limit for soil samples.

IX.) TCL Compound Identification:

The Percent Differences (%D's) between columns 1 and 2 exceeded the 70% QC limit for the following compounds and associated samples:

<u>Sample</u>	<u>Compound</u>	<u>%D</u>
102SB03401	dieldrin	557
	endrin ketone	72.3
102SB03601	4,4'-DDD	324
	endrin ketone	86.1
102SB03701	4,4'-DDD	204
	endrin aldehyde	999
	gamma chlordane	244
102SB03701DL	4,4'-DDD	197
102SB03801DL	gamma chlordane	324

Results for the compounds with %D's exceeding 300% were rejected (R). The positive results for compounds with %D's of 300% or less were flagged as estimated (J).

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS / CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max Conc.</u>	<u>Action Level</u>
ERB	aluminum	107 ug/L	107 mg/kg
CCB4	antimony	4.30 ug/L	4.30 mg/kg
ERB	barium	162 ug/L	162 mg/kg
ERB	calcium	2310 ug/L	2310 mg/kg
PBW	chromium	1.90 ug/L	1.90 mg/kg
ERB	iron	68.8 ug/L	68.8 mg/kg
ERB	magnesium	286 ug/L	286 mg/kg
ERB	manganese	13.9 ug/L	13.9 mg/kg
DWB	potassium	2080 ug/L	2080 mg/kg
ERB	sodium	27500 ug/L	27500 mg/kg
ERB	vanadium	2.10 ug/L	2.10 mg/kg
ERB	zinc	11.4 ug/L	11.4 mg/kg

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank (102DB04201),  
ERB = Equipment Rinsate Blank (102EB04201), PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration, preparation blank, deionized water or equipment rinsate blank were flagged as undetected (U).

IV.) ICP Interference Check Sample Results:

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

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) exceeded the 10% QC limit for calcium (11.2%), iron (19.3%) and manganese (124%) for serial dilution sample 102CB03601L (analyzed in SDG 25657A). All positive results for these analytes in the associated soil samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Differences (RPD's) for calcium (61.0%) and manganese (52.4%) exceeded the 35% QC limit for matrix duplicate sample 102SB04202. All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike (MS):

The Percent Recoveries (%R's) of antimony (40.1%) and mercury (27.0%) were below the 75-125% QC limit for spiked sample 102SB04202MS. All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Samples 102SB03601 and 102SB04101 were analyzed in this SDG, while corresponding duplicate samples 102CB03601 and 102CB04101 were analyzed in SDG 25657A. The calculable Relative Percent Differences were:

<u>Analyte</u>	<u>102SB03601, mg/kg</u>	<u>102CB03601, mg/kg</u>	<u>RPD</u>
aluminum	6560	5390	19
arsenic	25	26.6	6.2
cadmium	0.73	0.58	23
calcium	52800	54300	2.8
chromium	23.9	20.8	14
cobalt	69.8	57.5	19
copper	73.8	75.7	2.5
iron	9000	9720	7.6
lead	242	339	33
manganese	118	99.7	17
mercury	1.8	1.2	40
nickel	22.8	17.7	25
silver	0.25	1.8	151
vanadium	18.7	16	16
zinc	284	253	11
tin	8.6	6.3	31
cyanide	1.2	1.1	8.7

<u>Analyte</u>	<u>102SB04101, mg/kg</u>	<u>102CB04101, mg/kg</u>	<u>RPD</u>
aluminum	6000	4150	36
arsenic	2.6	1.3	67
chromium	97	197	68
cobalt	24.6	28	13
copper	6.5	2.1	102
iron	4030	2230	57

Analyte	102SB04101, mg/kg	102CB04101, mg/kg	RPD
lead	15	5.4	94
magnesium	4220	5140	19.6
mercury	0.11	0.05	75
nickel	4.6	4.4	4.4
vanadium	10	6	50

The results for all analytes with RPD's exceeding the 60% QC limit for each of these four soil samples were flagged as estimated (J).

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:

All laboratory data were acceptable with qualifications.

*DIESEL RANGE ORGANICS (DRO)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

V.) Laboratory Control Samples (LCS):

All LCS's criteria were met. No action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples for this fraction of the SDG. No action was required.

VIII.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

IX.) System Performance:

All System Performance criteria were met. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*GASOLINE RANGE ORGANICS (GRO)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Surrogate Recoveries:

The Percent Recoveries (%R's) of naphthalene were below the 65-135% QC limits for samples 102SB04001 (33%) and 102SB04002 (31%). The positive results for GRO in these samples were flagged as estimated (J).

V.) Laboratory Control Samples (LCS):

All LCS's criteria were met. No action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples for this fraction of the SDG. No action was required.

VIII.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

IX.) System Performance:

All System Performance criteria were met. No action was taken.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0056  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRICES: Soil and Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals and Cyanide, Organotin  
SDG NUMBERS: 25722A (Appendix IX, Level IV)  
25722B (Level III)

### SAMPLES:

#### SDG 25722A (Level IV):

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Semi-</u> <u>volatiles</u>	<u>Pesticides/</u> <u>PCB's</u>	<u>Metals/</u> <u>Cyanide</u>
574CB00801*	25723.01	Soil	X	X	X
574CB00801DL	25723.01DL	Soil		X	
574CB00801RE	25723.01RE	Soil	X		

\* = Field duplicate sample was associated with sample 574SB00801 in SDG 25722B.

#### SDG 25722 (Level III):

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Volatile</u> <u>Organics</u>	<u>Semi-</u> <u>volatiles</u>	<u>Pesticides/</u> <u>PCB's</u>	<u>Metals/</u> <u>Cyanide</u>	<u>Organotin</u>
084SB00701	25749.01	Soil	X	X	X	X	X
084SB00701RE	25749.01RE	Soil	X				
084SB00702	25749.02	Soil	X	X	X	X	X
084SB00801	25749.03	Soil	X	X	X	X	X
084SB00802	25749.04	Soil	X	X	X	X	X

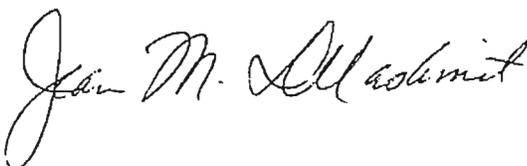
Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
102SB04301	25703.05	Soil		X	X	X
102SB04301DL	25703.05DL	Soil			X	
102SB04301RE	25703.05RE	Soil		X		
102SB04302	25703.06	Soil		X	X	X
102SB04302RE	25703.06RE	Soil		X		
102SB04401	25703.03	Soil		X	X	X
102SB04401RE	25703.03RE	Soil		X		
102SB04402	25703.04	Soil		X	X	X
102SB04501	25703.01	Soil		X	X	X
102SB04501RE	25703.01RE	Soil		X		
102SB04502	25703.02	Soil		X	X	X
574SB00501	25703.07	Soil		X	X	X
574SB00501DL	25703.07DL	Soil		X		
574SB00502	25703.08	Soil		X	X	X
574SB00502RE	25703.08RE	Soil		X		
574SB00601	25722.01	Soil		X	X	X
574SB00601DL	25722.01DL	Soil			X	
574SB00602	25722.02	Soil		X	X	X
574SB00701	25722.03	Soil		X	X	X
574SB00702	25722.04	Soil		X	X	X
574SB00801*	25722.05	Soil		X	X	X
574SB00801DL	25722.05DL	Soil		X	X	
574SB00802	25722.06	Soil		X	X	X
574SB00901	25722.07	Soil		X	X	X
574SB00902	25722.10	Soil		X	X	X
084TB00802	25749.05	Water	X			
574SB00901MS	25722.07MS	Soil		+		+
574SB00901MD	25722.07MD	Soil				+
574SB00901MSD	25722.07MSD	Soil		+		

\* = Field duplicate sample was associated with sample 574CB00801 in SDG 25722A..

+ = Non-billable Quality Control Sample

CB = FIELD DUPLICATE, DB = DEIONIZED BLANK, DL = DILUTION, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, TB = TRIP BLANK.

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

RELEASE SIGNATURE: 

### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 25722A Appendix IX, CLP Organics and Inorganics

SAMPLES: 574CB00801, 574CB00801DL, 574CB00801RE

### *SEMIVOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met. No action was required.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factor (RRF) for aramite (0.030) was below the 0.050 QC limit for the standards analyzed on 5/08/96 on instrument A. The non-detect results for this compound in associated samples 574CB00801 and 574CB00801RE were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 5/08/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
n-nitrosomorpholine	33.4%
o-toluidine	37.3%
1-nitroso-piperidine	35.0%
o,o ,o-triethyl phosphorothionate	35.1%
2,6-dichlorophenol	33.6%
hexachloropropene	32.8%
n-nitroso-di-n-butylamine	32.9%
1,2,4,5-tetrachlorobenzene	34.7%
safrole	33.6%
isosafrole	32.8%

1,4-napthaquinone	33.6%
1,3-dinitrobenzene	34.7%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.5%
2-naphthylamine	35.1%
thionazin	36.9%
2-methyl-5-nitroaniline	35.7%
diphenylamine	31.5%
sulfotepp	35.8%
phorate	36.4%
phenacetin	33.3%
diallate	35.0%
dimethoate	37.6%
4-aminobiphenyl	32.0%
1,3,5-trinitrobenzene	31.8%
pronamide	33.9%
pentachloronitrobenzene	34.9%
disulfoton	37.7%
methyl parathion	36.4%
parathion	39.1%
methapyrilene	41.3%
isodrin	34.9%
chlorobenzilate	39.3%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
2-acetylaminofluorene	35.4%
7,12-dimethylbenz(a)anthracene	47.9%

These compounds were not detected in the associated samples, so no action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.034) and hexachlorophene (0.015) were below the 0.050 QC limit for the standards analyzed on 6/02/96 at 21:08 on instrument A. The non-detect results for hexachlorophene in associated samples 574CB00801 and 574CB00801RE were rejected (R). The non-detect results for aramite were previously rejected based on the initial calibration.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/02/96 at 21:08 for the following compounds:

2,2-oxybis(1-chloropropane)	33.7%
2,6-dichlorophenol	80.7%
hexachloropropene	53.1%
1,2,4,5-tetrachlorobenzene	32.9%
pentachlorobenzene	48.6%
butylbenzylphthalate	33.2%
bis(2-ethylhexyl)phthalate	34.0%

methyl methanesulfonate	49.6%
n-nitrosomethylethylamine	57.4%
n-nitrosodiethylamine	70.3%
ethyl methanesulfonate	50.5%
2-picoline	43.5%
acetophenone	60.9%
n-nitrosopyrrolidine	73.4%
n-nitrosomorpholine	59.6%
o-toluidine	58.0%
1-nitroso-piperidine	60.0%
o,o,o-triethyl phosphorothionate	52.1%
n-nitroso-di-n-butylamine	61.8%
safrole	43.3%
isosafrole	40.3%
1,4-napthoquinone	40.2%
1,3-dinitrobenzene	42.0%
1-napthylamine	49.3%
2-napthylamine	47.8%
thionazin	68.0%
phorate	59.9%
phenacetin	59.1%
diallate	64.9%
dimethoate	78.1%
4-aminobiphenyl	45.4%
pronamide	49.4%
pentachloronitrobenzene	82.3%
disulfoton	55.4%
methyl parathion	71.6%
parathion	75.6%
methapyrilene	99.6%
isodrin	61.1%
chlorobenzilate	73.1%
3,3'-dimethylbenzidine	111%
famphur	188%
m-cresol	47.4%
4-nitroquinoline-1-oxide	39.3%
diphenylamine	41.9%
kepone	58.8%
7,12-dimethylbenz(a)anthracene	47.7%
hexachlorophene	68.3%
1,3,5-trinitrobenzene	32.7%
a,a-dimethylphenethylanime	31.4%

The non-detect results for aramite and hexachlorophene were previously rejected based on low RRF's in the initial and continuing calibration. The results for the other compounds in associated samples 574CB00801 and 574CB00801RE, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks associated with this SDG. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was necessary.

VIII.) Field Duplicates:

Sample 574CB00801 was analyzed in this SDG, while corresponding sample 574SB00801 was analyzed in SDG 25722B. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>574SB00801</u>	<u>574CB00801</u>	<u>RPD</u>
fluorene	2400	390	144
phenanthrene	26000	3600	151
anthracene	6200	890	150
fluoranthene	22000	4400	133
pyrene	18000	3000	143
benzo(a)anthracene	9300	1700	138
chrysene	9400	1900	133
bis(2-ethylhexyl)phthalate	490	530	7.8
benzo(b)fluoranthene	6000	1400	124
benzo(k)fluoranthene	4900	280	54.5
benzo(a)pyrene	7600	2300	107
indeno(1,2,3-cd)pyrene	5500	1400	119
dibenz(a,h)anthracene	2200	710	102
benzo(g,h,i)perylene	4300	1400	102

The positive results for compounds with RPD's exceeding the 60% QC limits were flagged as estimated (J) for the two samples.

IX.) Internal Standards Performance (ISTD's):

The Percent Recovery (%R) of perylene-d12 in samples 574CB00801 (209%) and 574CB00801RE (231%) exceeded the 50-200% QC limits. All positive results for the compounds quantitated on this

ISTD in the two samples were flagged as estimated (J).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene were rejected in the associated samples due to very low RRF's in the initial and continuing calibration. The original analysis of sample 574CB00801 was considered by the validator to be of preferable data quality to the reanalysis due to better ISTD performance. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the PEM standard analyzed on 5/30/96 at 14:32 on the primary column for alpha-BHC (28.8%) and gamma-BHC (28.4%). All positive and non-detect results for these compounds in associated samples 574CB00801 and 574CB00801DL were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the PEM standard analyzed on 5/30/96 at 14:32 on the secondary column for alpha-BHC (31.7%), beta-BHC (27.1%) and gamma-BHC (31.3%). All positive and non-detect results for these compounds in associated samples 574CB00801 and 574CB00801DL were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the PEM standard analyzed on 6/04/96 at 11:24 on the primary column for 4,4'-DDT (25.2) and methoxychlor (27.6%). All positive and non-detect results for these compounds in associated samples 574CB00801 and 574CB00801DL were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the PEM standard analyzed on 6/05/96 at 13:18 on the primary column for alpha-BHC (26.8%), 4,4'-DDT (27.6) and gamma-BHC (26.0%). All positive and non-detect results for these compounds in associated samples 574CB00801 and 574CB00801DL were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the PEM standard analyzed on 6/05/96 at 13:18 on the secondary column for alpha-BHC (32.4%), 4,4'-DDT (30.6) and gamma-BHC (28.1%). All positive and non-detect results for these compounds in associated samples 574CB00801 and 574CB00801DL were flagged as estimated (J) and (UJ).

### III.) Calibration:

#### Initial Calibration:

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

#### Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/04/96 at 14:59 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
gamma-BHC	29.3%	-
endosulfan I	99.9%	-
dieldrin	99.9%	-
4,4'-DDT	99.9%	51.1%
4,4'-DDD	99.9%	58.0%
heptachlor	-	71.2%

All positive and non-detect results for these compounds in associated sample 574CB00801 were flagged as estimated (J) and (UJ).

The Percent Difference (%D) for endrin aldehyde exceeded the 25% QC limit for the standard analyzed on 6/04/96 at 15:30 on the primary column (80.2%) and on the secondary column (69.6%). The non-detect results for this compound in associated samples 574CB00801 and 574CB00801DL were flagged as estimated (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards run on 6/05/96 at 18:57 on the primary column for methoxychlor (25.2%). The non-detect result for this compound in associated sample 574CB00801DL was flagged as estimated (UJ).

### IV.) Blanks:

#### Method Blank:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of decachlorobiphenyl in sample 574CB00801 on column 1 (264%) and column 2 (444%) exceeded the 30-150% QC limits. All positive results for this sample were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

Sample 574CB00801 was analyzed in this SDG, while corresponding sample 574SB00801 was analyzed in SDG 25722B. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>574SB00801</u>	<u>574CB00801</u>	<u>RPD</u>
heptachlor epoxide	33	29	3.2
4,4'-DDE	200	250	22.2
endrin	19	17	11.1
4,4'-DDD	33	14	80.1
4,4'-DDT	180	290	46.8
alpha chlordane	20	16	22.2
gamma chlordane	60	49	20.2

The positive results for 4,4'-DDD in these two samples were flagged as estimated (J) since the RPD for this compound exceeded the 60% QC limit for soil samples.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Differences (%D's) between columns 1 and 2 exceeded the 70% QC limit for samples 574CB00801 and 574CB00801DL:

<u>Client Sample #</u>	<u>Compound</u>	<u>%D</u>
574CB00801	endrin	105
	4,4'-DDD	261
574CB00801DL	4,4'-DDD	191

The positive results for these compounds were flagged as estimated (J).

X.) Pesticide Cleanup Check:

Florisol Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

The results for four compounds in sample 574CB00801 were above the instrument calibration range. These results were replaced with the dilution results with appropriate flagging. All other laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

There were no positive detections in the associated blank. The following analytes had negative results with absolute values greater than the IDL:

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB1	iron	-20.1 ug/L	20.1 mg/kg
PBS	potassium	-176 mg/kg	880 mg/kg
CCB1	silver	-2.30 ug/L	2.30 mg/kg
CCB1	vanadium	-1.10 ug/L	1.10 mg/kg

All associated sample results less than 5X the absolute value of the negative blank result were flagged as estimated (J).

IV.) ICP Interference Check Sample Results:

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

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

antimony	8 ug/L
barium	6 ug/L
chromium	2 ug/L
lead	5 ug/L
nickel	3 ug/L

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

Negative results were observed for cadmium (-2 ug/L), manganese (-4 ug/L), thallium (-7 ug/L) and zinc (-13 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

There were no Serial Dilution samples analyzed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There was no Duplicate Sample Analysis in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spike samples analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Sample 574CB00801 was analyzed in this SDG, while corresponding sample 574SB00801 was analyzed in SDG 25722B. The calculable Relative Percent Differences (RPD's) for these two sample were:

Analyte	574SB00801, mg/kg	574CB00801, mg/kg	RPD
aluminum	2840	3250	13.5
antimony	7.5	6.8	9.8
arsenic	5.9	6.2	4.9
barium	47.5	82.2	53.5
cadmium	1.6	1.8	11.8

<u>Analyte</u>	<u>574SB00801, mg/kg</u>	<u>574CB00801, mg/kg</u>	<u>RPD</u>
calcium	15600	12100	25.3
chromium	37.4	39.6	5.7
copper	933	1000	6.9
iron	11800	11400	3.4
lead	411	506	20.7
magnesium	770	685	11.7
manganese	122	130	6.3
mercury	0.45	0.39	14.2
nickel	70.3	83.0	16.6
vanadium	18.1	20.4	11.9
zinc	523	590	12.0
tin	93.9	88.8	5.5

No action was required since all RPD's were within the 60% QC limit for soil samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. 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:

All laboratory data were acceptable with qualifications.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 25722 Level III, CLP Organics and Inorganics

SAMPLES: 084SB00701, 084SB00701RE, 084SB00702, 084SB00801, 084SB00802, 102SB04301, 102SB04301DL, 102SB04301RE, 102SB04302, 102SB04302RE, 102SB04401, 102SB04401RE, 102SB04402, 102SB04501, 102SB04501RE, 102SB04502, 574SB00501, 574SB00501DL, 574SB00502, 574SB00502RE, 574SB00601, 574SB00601DL, 574SB00602, 574SB00701, 574SB00702, 574SB00801, 574SB00801DL, 574SB00802, 574SB00901, 574SB00902, 084TB00802, 574SB00901MS, 574SB00901MD, 574SB00901MSD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/01/96 on instrument C for the following compounds:

chloromethane	31.2%
bromomethane	30.5%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%

Since there were no positive results for these compounds in the associated samples, no action was taken.

The Average Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.046) was below the 0.050 QC limit for the standards analyzed on 4/29/96 on instrument R. The non-detect result for this compound in associated trip blank 084TB00802 were rejected (R).

The Percent Relative Standard Deviation (%RSD's) exceeded the 30% QC limit for the standards analyzed on 4/29/96 on instrument R for the following compounds:

chloromethane	33.9%
bromomethane	39.4%
chloroethane	40.6%
methylene chloride	34.9%
acetone	75.1%
carbon disulfide	34.8%
1,2-dichloroethane	30.7%
2-butanone	39.1%
2-chloroethyl vinyl ether	73.0%

Since the associated sample was a trip blank, no action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.040) was below the 0.050 QC limit for the standard analyzed on 5/29/96 at 14:35 on instrument C. The non-detect result for this compound in the associated samples 084SB00701, 084SB00701RE, 084SB00702, 084SB00801 and 084SB00802 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 5/29/96 at 14:35 on instrument C for the following compounds:

chloromethane	26.7%
chloroethane	30.0%
vinyl acetate	57.4%
2-chloroethyl vinyl ether	57.4%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. All other results for these compounds in associated samples 084SB00701, 084SB00701RE, 084SB00702, 084SB00801 and 084SB00802, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 5/29/96 at 09:24 on instrument R for acetone (33.1%) and vinyl acetate (43.1%). Since the associated sample was a trip blank, no action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the associated method blanks. No action was required.

Trip Blank:

There were no positive detections in the trip blank associated with this SDG. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of bromofluorobenzene (73%) and toluene-d8 (118%) were outside their

respective 74-121% and 81-117% QC limits for sample 084SB00701. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several %R's were slightly outside the QC limits. Data validation action based on LCS recoveries was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples for this fraction of the SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

The ISTD Percent Recoveries (%R's) were outside the 50-200% QC limits for the following samples:

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
084SB00701	1,4-difluorobenzene	39.6
	chlorobenzene-d5	31.7
084SB00701RE	chlorobenzene-d5	42.3

All positive and non-detect results for the compounds quantitated on these ISTD's were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The reanalysis of sample 084SB00701 was considered by the validator to be of preferable data quality to the original analysis due to improved surrogate and internal standard performances. All non-detect results

for 2-chloroethyl vinyl ether in the samples and blank in this SDG were rejected (R) due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

### SEMIVOLATILE ORGANICS

#### I.) Holding Times:

All Holding Time criteria were met. No action was required.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

#### III.) Calibration:

##### Initial Calibration:

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 5/29/96 on instrument F for benzo(g,h,i)perylene (31.9%). The associated positive sample results for this compound were flagged as estimated (J). The associated samples were 102SB04301, 102SB04301RE, 574SB00501, 574SB00502, 102SB04501, 102SB04401, 102SB04302, 102SB04502, 102SB04401RE, 102SB04402, 102SB04302RE, 574SB00501DL and 574SB00502RE.

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 6/07/96 on instrument V for hexachlorocyclopentadiene (36.4%). Since this compound was not detected in the associated samples, no action was necessary.

##### Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/04/96 at 12:21 on instrument M for the following compounds:

bis(2-chloroethyl) ether	26.7%
2,4-dinitrophenol	46.4%
4,6-dinitro-2-methylphenol	33.4%

The results for these compounds in associated samples 574SB00601, 574SB00602, 574SB00701, 574SB00702, 574SB00801, 574SB00802, 574SB00901 and 574SB00902, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/05/96 at 11:36 on instrument M for the following compounds:

bis(2-chloroethyl) ether	27.7%
2,4-dinitrophenol	39.0%
4,6-dinitro-2-methylphenol	32.0%

The results for these compounds in associated sample 574SB00801DL, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Diethylphthalate and bis(2-ethylhexyl)phthalate were detected at 190 ug/L and 36 ug/L, respectively, in water method blank SBLK1. All associated positive sample results for these compounds less than 10X the blank amounts were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL. The associated samples were 574SB00501, 574SB00502, 102SB04501, 102SB04401, 102SB04301, 102SB04302, 102SB04501RE, 102SB04502, 102SB04401RE, 102SB04402, 102SB04301RE, 102SB04302RE, 574SB00501DL and 574SB00502RE,

V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2,4,6-tribromophenol exceeded the 19-122% QC limits for sample 084SB00701 (127%). Since only one acid surrogate was outside the QC limits, no action was taken.

The Percent Recovery (%R) of 2,4,6-tribromophenol exceeded the 19-122% QC limits for sample 084SB00801 (126%). Since only one acid surrogate was outside the QC limits, no action was required.

The Percent Recoveries of terphenyl-d14 in the following samples exceeded the 18-137% QC limits:

574SB00501	147%
574SB00502	153%
102SB04501	154%
102SB04301	155%
102SB04302	143%

Since only one base/neutral surrogate was outside the QC limits for each sample, no action was taken.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. Several Percent Recoveries were outside the QC limits. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) of 2,4-dinitrotoluene exceeded the 28-89% QC limits for sample 574SB00901MSD (92%). Since this compound was not detected in unspiked sample 574SB00901, no action was necessary.

VIII.) Field Duplicates:

Sample 574CB00801 was analyzed in this SDG, while corresponding sample 574SB00801 was analyzed in SDG 25722B. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>574SB00801</u>	<u>574CB00801</u>	<u>RPD</u>
fluorene	2400	390	144
phenanthrene	26000	3600	151
anthracene	6200	890	150
fluoranthene	22000	4400	133
pyrene	18000	3000	143
benzo(a)anthracene	9300	1700	138
chrysene	9400	1900	133
bis(2-ethylhexyl)phthalate	490	530	7.8
benzo(b)fluoranthene	6000	1400	124
benzo(k)fluoranthene	4900	280	54.5
benzo(a)pyrene	7600	2300	107
indeno(1,2,3-cd)pyrene	5500	1400	119
dibenz(a,h)anthracene	2200	710	102
benzo(g,h,i)perylene	4300	1400	102

The positive results for compounds with RPD's exceeding the 60% QC limit were flagged as estimated (J) for the two samples.

IX.) Internal Standards Performance (ISTD's):

Internal standard area counts were below the 50-200% QC limits for the following samples:

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
574SB00501	perylene-d12	31.1
574SB00502	chrysene-d12	38.4
	perylene-d12	22.3
102SB04501	chrysene-d12	38.4
	perylene-d12	22.0
102SB04401	perylene-d12	26.8
102SB04301	chrysene-d12	40.6
	perylene-d12	20.2
102SB04302	chrysene-d12	40.8
	perylene-d12	22.4

All non-detect results for compounds quantitated on ISTD's with %R's less than 25% were rejected (R), and positive results were flagged as estimated (J). All positive and non-detect results for the compounds quantitated on ISTD's with %R's between 25% and 49%, were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

Several results in samples 574SB00501 and 574SB00801 were above the instrument's linear calibration range. These results were replaced with the dilution analysis results with appropriate flagging. All other CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The reanalyses of samples 102SB04301, 102SB04302, 102SB04401, 102SB04501 and 574SB00502 were considered by the validator to be of preferable data quality to the original analyses because of improved Internal Standards Performance. A total of eight results were rejected for compounds quantitated on internal standard perylene-d12 in samples 574SB00502, 102SB04501, 102SB04301 and 102SB04302. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the PEM standard analyzed on 6/06/96 at 13:33 on the primary column for 4,4'-DDT (31.9%) and methoxychlor (26.8%) and on the secondary column for 4,4'-DDT (31.8%) and methoxychlor (27.6%). All positive and non-detect results for these compounds in the samples in this SDG were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the PEM standard analyzed on 6/07/96 at 16:21 on the primary column for 4,4'-DDT (29.1%) and on the secondary column for endrin (27.2%). All associated results for 4,4'-DDT were previously flagged. No further action was taken. All positive and non-detect results for endrin in the samples in this SDG were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for PEM6V analyzed on 6/08/96 at 08:45 on the primary column for 4,4'-DDT (52.5%) and methoxychlor (36.0%) and on the secondary column for 4,4'-DDT (43.9%) and methoxychlor (28.8%). All positive and non-detect results for these compounds in the associated samples were previously flagged. No further action was required.

The Percent Breakdown (%B) of 4,4'-DDT exceeded the 20% QC Limit for the PEM standard analyzed on 6/08/96 at 08:45 on the primary (32.7%) and secondary (30.7%) columns. The results for this compound in the associated samples were previously flagged, so no action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for PEM3D analyzed on 6/13/96 at 20:01 on the primary column for alpha-BHC (28.0%), gamma-BHC (28.0%) and endrin (32.8%). All associated positive and non-detect sample results for these compounds were flagged as estimated (J) and (UJ). The associated samples were 084SB00601DL and 102SB04301DL.

The Percent Differences (%D's) exceeded the 25% QC limit for PEM3E analyzed on 6/14/96 at 15:14 on the primary column for alpha-BHC (37.0%), 4,4'-DDT (54.4%), methoxychlor (40.4%) and gamma-BHC (29.0%) and on the secondary column for 4,4'-DDT (60.5%) and methoxychlor (44.4%). All positive and non-detect results for these compounds in the associated samples were previously flagged. No further action was required.

The Percent Breakdown (%B) of 4,4'-DDT exceeded the 20% QC limit for PEM3E analyzed on 6/14/96 at 15:14 on the primary column (36.3%). All results for this compound in the associated samples were previously flagged. No action was taken.

The Percent Difference (%D) exceeded the 25% QC limit for the PEM standard analyzed on 6/17/96 at 12:35 on the primary column for alpha-BHC (26.0%) and on the secondary column for methoxychlor (31.6%). The non-detect results for these compounds in associated sample 574SB00502 were flagged as estimated (UJ).

### III.) Calibration:

#### Initial Calibration:

All Initial Calibration criteria were met. No action was required.

#### Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/08/96 at 09:16 on the primary column for 4,4'-DDT (56.5%) and methoxychlor (41.5%). All positive and non-detect results for these compounds in samples 574SB00501, 574SB00601, 574SB00602, 574SB00701, 574SB00702, 574SB00801, 574SB00802, 574SB00901, 574SB00902, 574SB00801DL were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/08/96 at 09:16 on the secondary column for 4,4'-DDT (52.9%), endrin (25.9%) and methoxychlor (32.3%). All positive and non-detect results for these compounds in samples 574SB00501, 574SB00601, 574SB00602, 574SB00701, 574SB00702, 574SB00801, 574SB00802, 574SB00901, 574SB00902, 574SB00801DL were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/08/96 at 09:47 on the secondary column for endrin ketone (25.4%). All positive and non-detect results for this compound in samples 574SB00501, 574SB00601, 574SB00602, 574SB00701, 574SB00702, 574SB00801, 574SB00802, 574SB00901, 574SB00902, 574SB00801DL were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/11/96 at 09:57 on the primary column for 4,4'-DDD (29.2%). The positive and non-detect results for this compound in associated samples 084SB00701, 084SB00702, 084SB00801 and 084SB00802 were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/11/96 at 19:34 on the primary column for 4,4'-DDD (33.0%). The positive and non-detect results for this

compound in the associated samples were previously flagged. No action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/13/96 at 21:03 on the primary column for beta-BHC (25.8%), endrin ketone (27.3%) and endrin aldehyde (29.7%). All positive and non-detect results for these compounds in associated samples 084SB00701, 084SB00702, 084SB00801, 084SB00802, 102SB04301DL and 574SB00601DL were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 6/14/96 at 04:47 on the primary column for 4,4'-DDD (27.1%). All positive and non-detect results for this compound in associated samples 102SB04301DL and 574SB00601DL were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 6/14/96 at 05:17 on the primary column for endrin aldehyde (28.1%). All positive and non-detect results for this compound in associated samples 102SB04301DL and 574SB00601DL were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/17/96 at 14:53 on the primary column for 4,4'-DDT (29.8%). The positive result for this compound in associated sample 574SB00502 was flagged as estimated (J).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/17/96 at 14:53 on the secondary column for the following compounds:

endosulfan I	99.9%
dieldrin	46.3%
endrin	81.1%
4,4'-DDD	99.9%
methoxychlor	34.9%

All positive and non-detect results for these compounds in associated sample 574SB00502 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/17/96 at 15:23 on the secondary column for aldrin (59.3%) and endosulfan II (43.7%). The non-detect results for these compounds in associated sample 574SB00502 were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

There were no positive detections in the method blanks. No action was required.

#### V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of decachlorobiphenyl (DCB) were above the 30-150% QC limits for the following samples:

<u>Client Sample #</u>	<u>%R, Column 1</u>	<u>%R, Column 2</u>
102SB04301	161	-
574SB00501	-	242
574SB00602	188	-
574SB00801	344	521

All positive results for these samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was required.

IX.) Field Duplicates:

Sample 574SB00801 was analyzed in this SDG, while field duplicate sample 574CB00801 was analyzed in SDG 25722A. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>574SB00801</u>	<u>574CB00801</u>	<u>RPD</u>
heptachlor epoxide	33	29	3.2
4,4'-DDE	200	250	22.2
endrin	19	17	11.1
4,4'-DDD	33	14	80.1
4,4'-DDT	180	290	46.8
alpha chlordane	20	16	22.2
gamma chlordane	60	49	20.2

The positive results for 4,4'-DDD in these two samples were flagged as estimated (J) since the RPD for this compound exceeded the 60% QC limit for soil samples.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
ICB	aluminum	25.8 ug/L	25.8 mg/kg
PBS2	chromium	0.44 mg/kg	2.20 mg/kg
CCB1	iron	20.8 ug/L	20.8 mg/kg
PBS2	manganese	0.45 mg/kg	2.26 mg/kg
CCB1	silver	2.70 ug/L	2.70 mg/kg
PBS2	sodium	94.0 mg/kg	470 mg/kg
PBS2	tin	4.96 mg/kg	24.8 mg/kg
CCB1	vanadium	1.20 ug/L	1.20 mg/kg

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank, PBS = PreparationBlank (Soil)

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

IV.) ICP Interference Check Sample Results:

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

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) for chromium (21.5%), nickel (16.5%) and zinc (14.1%) exceeded the 10% QC limit. All positive results for these analytes in the soil sample in this SDG were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All Duplicate Sample criteria were met. No action was required.

VIII.) Matrix Spike Analysis (MS):

The Percent Recoveries (%R's) were below the 75-125% QC limits for spiked sample 574SB00901MS for antimony (66.7%), lead (74.3%) and manganese (34.6%). All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Sample 574SB00801 was analyzed in this SDG, while field duplicate sample 574CB00801 was analyzed in SDG 25722A. The calculable Relative Percent Differences (RPD's) were:

Analyte	574SB00801.mg/kg	574CB00801 mg/kg	RPD
aluminum	2840	3250	13.5
antimony	7.5	6.8	9.8
arsenic	5.9	6.2	4.9
barium	47.5	82.2	53.5
cadmium	1.6	1.8	11.8
calcium	15600	12100	25.3
chromium	37.4	39.6	5.7
copper	933	1000	6.9
iron	11800	11400	3.4
lead	411	506	20.7
magnesium	770	685	11.7
manganese	122	130	6.3
mercury	0.45	0.39	14.2
nickel	70.3	83.0	16.6
vanadium	18.1	20.4	11.9
zinc	523	590	12.0
tin	93.9	88.8	5.5

No action was required since all RPD's were within the 60% QC limit for soil samples.

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:

The result for chromium in sample 574SB00602 was not reported on the spreadsheet. This result and the appropriate flagging were inserted on the spreadsheet during validation. The result was present in the electronic data. All laboratory data were acceptable with qualifications.

*ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) for tetrabutyltin (0.028) and dibutyltin (0.048) were below the 0.050 QC limit for the standards analyzed on 6/18/96 on instrument J. The results for these compounds in the soil samples in this SDG, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) for tetrabutyltin (0.035) was below the 0.050 QC limit for the standard analyzed on 6/18/96 at 17:39 on instrument J. The results for this compound in the associated samples were previously rejected based on the initial calibration. No further action was required.

The Percent Difference (%D) for tributyltin was 26.6%, which exceeded the 25% QC limit for the standard analyzed on 6/18/96 at 17:39 on instrument J. The results for this compound in all associated soil samples in this SDG, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

There were no positive detections in the associated method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for tetrabutyltin and dibutyltin in the samples in this SDG were rejected (R) due to low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

# 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: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0059  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Soil  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's  
  
SDG NO: 25775A (Level IV)

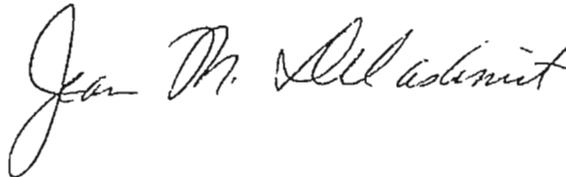
### SAMPLE:

<u>Client</u>	<u>Lab</u>	<u>Matrix</u>	<u>PCDD/ PCDF</u>
<u>Sample #</u> 559CB02401	<u>Sample #</u> 25788.01	Soil	X

C = FIELD DUPLICATE (Soil)

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon, Jean M. Delashmit

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 25775A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLE: 559CB02401

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was required.

Calibration Verifications:

The Percent Difference (%D) of 13C-123478-HxCDF was 35.2% for the ending calibration verification run on 6/14/96 on instrument AutoSpec, which exceeded the 35% QC limit. All associated positive results in sample 559CB02401 were flagged as estimated (J).

IV.) Blanks:

Method Blanks:

The following 2,3,7,8-substituted PCDF was detected in a method blank at the concentration indicated:

<u>Method</u>		<u>Conc.</u>	<u>Action Level</u>
<u>Blank ID</u>	<u>Compound</u>	<u>ng/kg</u>	<u>ng/kg</u>
DFBLK1	1234678-HpCDF	0.34	1.7

The results for this compound in the associated sample was greater than 5X the blank amount, so no action was required.

Field Blanks:

No field blanks were analyzed in this SDG. No action was taken.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

MS/MSD's were not analyzed in this SDG. No action was taken.

Two LCS samples were analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

The sample corresponding to field duplicate sample 559CB02401 was not analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Upon validation, laboratory "X" flags (meaning "EMPC") were removed for all method blanks and were replaced with "EMPC".

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0059  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRICES: Soil and Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals and Cyanide, Organotin  
SDG NUMBERS: 25775A (Appendix IX, Level IV)  
25775B (Level III)

### SAMPLES:

#### SDG 25775A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
559CB02401*	25788.01	Soil	X	X	X	X
559CB02401RE	25788.01RE	Soil	X			

\* = Field duplicate sample was associated with sample 559SB02401 in SDG 25775B.

#### SDG 25775 (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide	Organotin
083SB01001	25775.03	Soil	X	X	X	X	X
083SB01001RE	25775.03RE	Soil		X			
083SB01002	25775.04	Soil	X	X	X	X	X
084SB00901	25775.01	Soil	X	X	X	X	X
084SB00902	25775.02	Soil	X	X	X	X	X
559SB02301	25775.05	Soil	X	X	X	X	
559SB02301RE	25775.05RE	Soil		X	X		

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>Volatile</u> <u>Organics</u>	<u>Semi-</u> <u>volatiles</u>	<u>Pesticides/</u> <u>PCB's</u>	<u>Metals/</u> <u>Cyanide</u>
559SB02302	25775.08	Soil	X	X	X	X
559SB02302DL	25775.08DL	Soil			X	
559SB02401*	25787.01	Soil	X	X	X	X
559SB02401RE	25787.01RE	Soil		X		
559SB02402	25787.02	Soil	X	X	X	X
559SB02501	25787.03	Soil	X	X	X	X
559SB02501DL	25787.03DL	Soil		X		
559SB02501RE	25787.03RE	Soil	X			
559SB02502	25787.06	Soil	X	X	X	X
559SB02502RE	25787.06RE	Soil	X			
559SB02801	25787.07	Soil	X	X	X	X
559SB02801RE	25787.07RE	Soil	X			
559SB02802	25787.08	Soil	X	X	X	X
559SB02802RE	25787.08RE	Soil	X			
559SB02901	25787.09	Soil	X	X	X	X
559SB02901RE	25787.09RE	Soil	X			
559SB02902	25787.10	Soil	X	X	X	X
559DB02301	25775.10	Water	X	X	X	X
559DB02301RE	25775.10RE	Water		X		
559EB02301	25775.09	Water	X	X	X	X
559TB02301	25775.11	Water	X			
559TB02902	25787.11	Water	X			
559SB02501MS	25787.03MS	Soil			+	+
559SB02501MD	25787.03MD	Soil				+
559SB02501MSD	25787.03MSD	Soil			+	

\* = Sample was associated with field duplicate sample 559CB02401 in SDG 25775A.

+ = Non-billable Quality Control Sample

CB = FIELD DUPLICATE, DB = DEIONIZED BLANK, DL = DILUTION, EB = EQUIPMENT BLANK, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, TB = TRIP BLANK

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

RELEASE SIGNATURE:



## Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 25775A Appendix IX, CLP Organics and Inorganics

SAMPLES: 559CB02401, 559CB02401RE

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factors (RRF's) for acrolein (0.034), isobutyl alcohol (0.007), acetonitrile (0.026) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards analyzed on 2/1/96 on instrument C. The results for these compounds in associated samples 559CB02401 and 559CB02401RE, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/1/96 on instrument C for the following compounds:

bromoethane	31.2%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%
isobutyl alcohol	48.6%
dibromomethane	32.1%
chloroprene	30.7%
acrylonitrile	31.2%
propionitrile	30.9%
methacrylonitrile	30.6%
1,4-dioxane	35.2%
1,2-dibromoethane	30.2%
1,2,3-trichloropropene	32.1%

The non-detect results for 1,4-dioxane and isobutyl alcohol were previously rejected based on low RRF's. The other compounds were not detected in the sample, so no further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRF's) for 2-chloroethyl vinyl ether (0.048), acrolein (0.008), acetonitrile (0.026), isobutyl alcohol (0.008), and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standard analyzed on 5/31/96 at 10:53 on instrument C. The non-detect result for 2-chloroethyl vinyl ether in associated sample 559CB02401 was rejected (R). The results for the other compounds in the sample were previously rejected based on the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 5/31/96 at 10:53 for the following compounds:

2-chloroethyl vinyl ether	56.8%
acrolein	76.5%
bromomethane	25.3%
chloroethane	33.7%
acetone	41.6%
1,1,1-trichloroethane	28.1%
vinyl acetate	64.1%
2-hexanone	25.8%
ethyl methacrylate	31.5%
1,2-dibromoethane	25.6%
1,1,1,2-tetrachloroethane	29.9%
1,2,3-trichloropropane	33.0%
dichlorofluoromethane	63.5%
trichlorofluoromethane	76.2%
1,2-dibromo-3-chloropropane	46.7%

The results for 2-chloroethyl vinyl ether and acrolein in the sample were previously rejected. The positive result for trichlorofluoromethane in associated sample 559CB02401 was flagged as estimated (J). The results for the other compounds in sample 559CB02401, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factors (RRF's) of 2-chloroethyl vinyl ether (0.047), acrolein (0.015), acetonitrile (0.023), isobutyl alcohol (0.009) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards analyzed on 6/03/96 at 10:54 on instrument C. The non-detect result for 2-chloroethyl vinyl ether in associated sample 559CB02401RE was rejected (R). The results for the other compounds in this sample were previously rejected based on the initial calibration.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/03/96 at 10:54 on instrument C for the following compounds:

2-chloroethyl vinyl ether	57.7%
acrolein	55.9%
isobutyl alcohol	28.6%
bromomethane	27.0%
chloroethane	34.3%
acetone	32.1%
vinyl acetate	68.5%

methyl iodide	57.2%
chloroprene	31.1%
trans-1,4-dichloro-2-butene	36.7%
pentachloroethane	36.5%
methacrylonitrile	37.5%
methyl methacrylate	45.5%
ethyl methacrylate	60.4%
1,2-dibromoethane	44.1%
1,1,1,2-tetrachloroethane	55.4%
1,2,3-trichloropropane	57.3%
1,2-dibromo-3-chloropropane	64.3%

The results for 2-chloroethyl vinyl ether, acrolein and isobutyl alcohol in associated sample 559CB02401RE were previously rejected (R). The results for the other compounds in this sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

There were no positive detections in the method blanks. No action was taken.

##### Deionized Water Blank:

Methylene chloride, chloroform and bromodichloromethane were detected at 2 ug/L, 42 ug/L and 4 ug/L, respectively, in deionized water blank 559DB02301, which was analyzed in SDG 25775B. The positive result for methylene chloride in associated sample 559CB02401, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being replaced with the CRQL. The other two compounds were not detected in the associated samples. No further action was necessary.

##### Equipment Rinsate Blank:

Methylene chloride, chloroform and bromodichloromethane were detected at 2 ug/L, 35 ug/L and 4 ug/L, respectively, in equipment rinsate blank 559EB02301, which was analyzed in SDG 25775B. Methylene chloride was qualified using the deionized water blank. The other compounds were not detected in the associated samples. No action was required.

##### Trip Blanks:

Carbon disulfide was detected at 1.0 ug/L in trip blank 559TB02902 (analyzed in SDG 25846B). There were no positive results for this compound in the associated samples. No action was required.

#### V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of bromofluorobenzene were below the 74-121% QC limits for samples 559CB02401 (72%) and 559CB02401RE (72%). All positive and non-detect results for these two samples were flagged as estimated (J) and (UJ).

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All %R criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

Sample 559CB02401 was analyzed in this SDG, while sample 559SB02401 was analyzed in SDG 25775B. There were no calculable Relative Percent Differences (RPD's) for this duplicate sample pair, so no action was necessary.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of chlorobenzene-d5 were below the 50-200% QC limits for samples 559CB02401 (38.0%) and 559CB002401RE (40.0%). The results for the compounds quantitated on this ISTD were previously flagged based on surrogate recoveries. No further action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for 2-chloroethyl vinyl ether, acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in both analyses of sample 559CB02401 due to low RRF's in the initial and continuing calibrations. The original analysis of sample 559CB02401 was considered by the validator to be of preferable data quality to the reanalysis based on its better holding time. All other laboratory data were acceptable with qualifications.

## SEMIVOLATILE ORGANICS

### I.) Holding Times:

All Holding Time criteria were met. No action was required.

### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

### III.) Calibration:

#### Initial Calibration:

The average Relative Response Factor (RRF) for aramite (0.030) was below the 0.050 QC limit for the standards analyzed on 5/08/96 on instrument A. The result for this compound in associated sample 559CB02401, which was a non-detect, was rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 5/08/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
n-nitrosomorpholine	33.4%
o-toluidine	37.3%
1-nitroso-piperidine	35.0%
o,o ,o-triethyl phosphorothionate	35.1%
2,6-dichlorophenol	33.6%
hexachloropropene	32.8%
n-nitroso-di-n-butylamine	32.9%
1,2,4,5-tetrachlorobenzene	34.7%
safrole	33.6%
isosafrole	32.8%
1,4-napthaquinone	33.6%
1,3-dinitrobenzene	34.7%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.5%
2-naphthylamine	35.1%
thionazin	36.9%
2-methyl-5-nitroaniline	35.7%
diphenylamine	31.5%
sulfotepp	35.8%
phorate	36.4%
phenacetin	33.3%

diallate	35.0%
dimethoate	37.6%
4-aminobiphenyl	32.0%
1,3,5-trinitrobenzene	31.8%
pronamide	33.9%
pentachloronitrobenzene	34.9%
disulfoton	37.7%
methyl parathion	36.4%
parathion	39.1%
methapyrilene	41.3%
isodrin	34.9%
chlorobenzilate	39.3%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
2-acetylaminofluorene	35.4%
7,12-dimethylbenz(a)anthracene	47.9%

These compounds were not detected in the associated samples, so no action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.039) and hexachlorophene (0.017) were below the 0.050 QC limit for the standards analyzed on 6/07/96 at 10:51 on instrument A. The non-detect result for hexachlorophene in associated sample 559CB02401 was rejected (R). The non-detect result for aramite was previously rejected based on the initial calibration.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/07/96 at 10:51 for the following compounds:

2,6-dichlorophenol	50.4%
hexachloropropene	82.4%
1,2,4,5-tetrachlorobenzene	50.1%
hexachlorocyclopentadiene	39.4%
pentachlorobenzene	40.0%
aramite	31.7%
methyl methanesulfonate	52.1%
n-nitrosomethylethylamine	56.8%
n-nitrosodiethylamine	58.0%
ethyl methanesulfonate	45.8%
2-picoline	50.8%
acetophenone	54.4%
n-nitrosopyrrolidine	52.2%
n-nitrosomorpholine	54.3%
o-toluidine	49.8%
1-nitroso-piperidine	56.3%
o,o,o-triethyl phosphorothionate	51.9%
n-nitroso-di-n-butylamine	48.8%

safrole	52.0%
isosafrole	42.8%
1,4-naphthoquinone	41.6%
1,3-dinitrobenzene	58.9%
1-naphthylamine	51.0%
2-naphthylamine	56.5%
thionazin	58.2%
phorate	44.7%
phenacetin	59.7%
diallate	42.6%
dimethoate	73.8%
4-aminobiphenyl	48.7%
pronamide	50.4%
pentachloronitrobenzene	66.9%
disulfoton	32.7%
methyl parathion	67.7%
parathion	73.5%
methapyrilene	79.9%
isodrin	49.8%
chlorobenzilate	61.1%
3,3'-dimethylbenzidine	85.0%
famphur	180%
m-cresol	45.2%
4-nitroquinoline-1-oxide	93.4%
diphenylamine	36.9%
kepone	88.1%
7,12-dimethylbenz(a)anthracene	44.1%
hexachlorophene	64.0%
p-phenylenediamine	27.0%
1,3,5-trinitrobenzene	70.7%
a,a-dimethylbenz(a)anthracene	47.7%

The non-detect results for aramite and hexachlorophene were previously rejected based on low RRF's in the initial and continuing calibrations. The results for the other compounds in associated sample 559CB02401, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blanks:

There were no positive detections in the associated deionized water and equipment rinsate blanks (analyzed in SDG 25775B). No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2,4,6-tribromophenol exceeded the 19-122% QC limits for sample 559CB02401 (134%). Since only one surrogate exceeded the QC limits, no action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was necessary.

VIII.) Field Duplicates:

Sample 559CB02401 was analyzed in this SDG, while corresponding sample 559SB02401 was analyzed in SDG 25775B. There were no calculable RPD's for this field duplicate pair. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene were rejected in the associated sample due to very low RRF's in the continuing and initial calibrations. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/14/96 at 15:47 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
4,4'-DDT	42.6%	65.3%
methoxychlor	-	45.2%

The results for these compounds in sample 559CB02401 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25 % QC limit for the standard analyzed on 6/14/96 at 16:17 on the secondary column for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
endosulfan sulfate	-	25.1%
endrin ketone	25.4%	30.7%
endrin aldehyde	-	25.8%

The results for these compounds in associated sample 559CB02401, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in the associated deionized water and equipment rinsate blanks (analyzed in SDG 25775B). No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

The calculable Relative Percent Difference (RPD) for 4,4'-DDT (50%) was within the 60% QC limit for soil samples for field duplicate samples 559CB02401 and 559SB02401 (analyzed in SDG 25775B). No action was necessary.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Differences (%D's) between columns 1 and 2 exceeded the 70% QC limit for sample 559CB02401:

<u>Client Sample #</u>	<u>Compound</u>	<u>%D</u>
559CB02401	4,4'-DDE	163
	4,4'-DDD	127
	gamma chlordane	952

The %D for gamma chlordane exceeded 300%. The positive result was flagged as undetected (U) with the analytical result being rounded up to the next significant figure. The positive results for the two other compounds were flagged as estimated (J).

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

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

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
559EB02301	aluminum	103 ug/L	103 mg/kg
559DB02301	barium	184 ug/L	184 mg/kg
559DB02301	calcium	2240 ug/L	2240 mg/kg
559EB02301	iron	21.8 ug/L	21.8 mg/kg
559DB02301	lead	5.20 ug/L	5.20 mg/kg
559DB02301	magnesium	265 ug/L	265 mg/kg
559DB02301	manganese	13.8 ug/L	13.8 mg/kg
559DB02301	potassium	2090 ug/L	2090 mg/kg
559DB02301	sodium	28200 ug/L	28200 mg/kg
559DB02301	zinc	10.4 ug/L	10.4 mg/kg

DB = Deionized Water Blank, EB = Equipment Rinsate Blank

The deionized water and equipment rinsate blanks were analyzed in SDG 25775B. All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration or preparation blank were flagged as undetected (U).

IV.) ICP Interference Check Sample Results:

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

Copper (13 ug/L) was detected in ICS Solution A at a concentration greater than the IDL. This analyte should not be present. Additionally, negative results were observed for antimony (-41ug/L), manganese (-9 ug/L) and nickel (12 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated sample

at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) for arsenic (11.4%), calcium (10.1), iron (13.0), manganese (12.1%), nickel (25.2%), tin (10.1) and zinc (15.0%) exceeded the 10% QC limit in the serial dilution analysis in SDG 25775B. The positive results for these analytes in the soil sample in this SDG were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Differences (RPD's) exceeded the 35% QC limit for soil samples for copper (99.2), iron (41.5%), lead (51.6), nickel (49.4%), tin (36.9%) and zinc (98.1%) in sample 559SB02501MD, which was analyzed in SDG 25775B. All positive and non-detect results for these analytes in sample 559CB02401 were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike Analysis (MS):

The Percent Recoveries (%R's) were below the 75-125% QC limits for antimony (55.6), lead (30.4%), manganese (49.5%) and nickel (73.4%) in sample 559SB02501MS, analyzed in SDG 25775B. The results for these analytes in sample 559CB02401 were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Sample 559CB02401 was analyzed in this SDG, while corresponding sample 559SB02401 was analyzed in SDG 25775B. The calculable Relative Percent Differences (RPD's) were:

Analyte	559SB02401, mg/kg	559CB02401, mg/kg	RPD
aluminum	4120	5210	23.3
arsenic	4.2	6.1	36.8
cadmium	2.5	2.7	7.7
calcium	26800	40900	41.6
chromium	10.2	13.0	24.1
copper	44.3	52.0	16.0
iron	3250	4460	31.3
lead	70.1	90.2	25.1
magnesium	764	1410	59.4
manganese	21.6	30.9	35.4
mercury	0.12	0.16	28.6
nickel	6.8	10.0	38.1
selenium	0.8	0.73	9.2
vanadium	7.4	10.1	30.9
zinc	97.8	128	26.7
tin	7.2	9.6	28.6

No action was required since all RPD's were within the 60% QC limit for soil samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. 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:

All laboratory data were acceptable with qualifications.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 25775 Level III, CLP Organics and Inorganics

SAMPLES: 083SB01001, 083SB01001RE, 083SB01002, 084SB00901, 084SB00902, 559SB02301, 559SB02301RE, 559SB02302, 559SB02302DL, 559SB02401, 559SB02401RE, 559SB02402, 559SB02501, 559SB02501DL, 559SB02501RE, 559SB02502, 559SB02502RE, 559SB02801, 559SB02801RE, 559SB02802, 559SB02802RE, 559SB02901, 559SB02901RE, 559SB02902, 559DB02301, 559DB02301RE, 559EB02301, 559TB02301, 559TB02902, 559SB02501MS, 559SB02501MD, 559SB02501MSD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/01/96 on instrument C for the following compounds:

chloromethane	31.2%
bromomethane	30.5%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%

The positive results for acetone in associated samples 559SB02301, 559SB02302 and 559SB02401 were flagged as estimated. Since the other compounds were not detected in the associated samples, no further action was required.

The Average Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.046) was below the 0.050 QC limit for the standards analyzed on 4/29/96 on instrument R. The non-detect results for this compound in associated blanks 559DB02301, 559EB02301, 559TB02301 and 559TB02901 were rejected (R).

The Percent Relative Standard Deviation (%RSD's) exceeded the 30% QC limit for the standards analyzed on 4/29/96 on instrument R for the following compounds:

chloromethane	33.9%
bromomethane	39.4%
chloroethane	40.6%
methylene chloride	34.9%
acetone	75.1%
carbon disulfide	34.8%
1,2-dichloroethane	30.7%
2-butanone	39.1%
2-chloroethyl vinyl ether	73.0%

The results for 2-chloroethyl vinyl ether were previously rejected. Since the associated samples were field and trip blanks, no further action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.048) was below the 0.050 QC limit for the standards analyzed on 5/31/96 at 10:53 on instrument C. The non-detect result for this compound in associated samples 084SB00901, 084SB00902, 083SB01002, 559SB02301, 559SB02302, 559SB02401, 083SB01001, 559SB02502, 559SB02801, 559SB02802, 559SB02901, 559SB02902 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 5/31/96 at 10:53 on instrument C for the following compounds:

bromomethane	25.3%
chloroethane	33.7%
acetone	41.6%
1,1,1-trichloroethane	28.1%
vinyl acetate	64.1%
2-hexanone	25.8%
2-chloroethyl vinyl ether	56.8%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. All other associated samples results for these compounds, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.047) was below the 0.050 QC limit for the standards analyzed on 6/03/96 at 10:54 on instrument C. The non-detect results for this compound in associated samples 559SB02402, 559SB02501RE, 559SB02502RE, 559SB02801RE, 559SB02802RE and 559SB02901RE were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/03/96 at 10:54 on instrument C for the following compounds:

bromomethane	27.0%
chloroethane	34.3%
acetone	32.1%
vinyl acetate	68.5%
2-chloroethyl vinyl ether	57.7%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected (R). The positive and non-detect results for the other compounds in the associated samples 559SB02402, 559SB02501RE, 559SB02502RE, 559SB02801RE, 559SB02802RE and 559SB02901RE were flagged as estimated (J) and (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.015) was below the 0.050 QC limit for the standards analyzed on 5/31/96 at 08:55 on instrument R. The non-detect results for this compound in the associated samples were previously rejected. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 5/31/96 at 08:55 on instrument R for the following compounds:

acetone	27.0%
vinyl acetate	53.1%
2-chloroethyl vinyl ether	67.4%

Since the associated samples were field blanks, no action was taken.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.016) was below the 0.050 QC limit for the standards analyzed on 6/04/96 at 11:17 on instrument R. The non-detect results for this compound in the associated samples were previously rejected. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/04/96 at 11:17 on instrument R for 2-chloroethyl vinyl ether (65.2%) and vinyl acetate (55.6%). Since the associated samples were trip blanks, no action was necessary.

#### IV.) Blanks:

##### Method Blanks:

Acetone was detected at 4 ug/L in water method blank VBLK4. Since the only associated samples were field blanks, no action was necessary.

##### Deionized Water Blank:

Methylene chloride, chloroform and bromodichloromethane were detected at 2 ug/L, 42 ug/L and 4 ug/L, respectively, in deionized water blank 559DB02301. All positive results for methylene chloride in associated samples 083SB01001, 083SB01002, 084SB00901, 084SB00902, 559SB02301 and 559SB02302, less than 10X the blank amount were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL. The other compounds were not detected in the associated samples, so no further action was required.

Equipment Rinsate Blank:

Methylene chloride, chloroform and bromodichloromethane were detected at 2 ug/L, 35 ug/L and 4 ug/L, respectively, in equipment rinsate blank 559EB02301. The positive results for methylene chloride in the associated samples were previously flagged based on the deionized water blank. The other compounds were not detected in the associated samples. No further action was required.

Trip Blanks:

Methylene chloride and acetone were detected at 3 ug/L and 4 ug/L, respectively, in trip blank 559TB02301. All results for acetone in the associated samples were either non-detects or greater than 10X the blank amount. The results for methylene chloride in the associated samples were previously flagged based on the deionized water blank. No further action was taken.

Carbon disulfide was detected at 1 ug/L in trip blank 559TB02902. There were no detections of this compound in the associated samples. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of bromofluorobenzene and toluene-d8 were outside their respective 74-121% and 81-117% QC limits for the following samples:

<u>Client Sample #</u>	<u>Surrogate</u>	<u>%R</u>
559SB02802	toluene-d8	189
	bromofluorobenzene	39
559SB02802RE	toluene-d8	147
	bromofluorobenzene	50

All positive and non-detect results for these samples were flagged as estimated (J) and (UJ).

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Several %R's were slightly outside QC limits. Data validation action based on LCS recoveries was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

Sample 559SB02401 was analyzed in this SDG, while field duplicate sample 559CB02401 was analyzed in SDG 25775A. There were no calculable Relative Percent Differences (RPD's) for this duplicate sample pair. No action was necessary.

IX.) Internal Standards Performance (ISTD):

The ISTD Percent Recoveries (%R's) were outside the 50-200% QC limits for the following samples:

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
559SB02501	chlorobenzene-d5	45.1
559SB02502	bromochloromethane	49.8
	1,4-difluorobenzene	45.0
	chlorobenzene-d5	42.1
559SB02801	bromochloromethane	45.6
	1,4-difluorobenzene	43.6
	chlorobenzene-d5	37.5
559SB02802	bromochloromethane	45.3
	1,4-difluorobenzene	28.8
	chlorobenzene-d5	10.4
559SB02901	1,4-difluorobenzene	48.0
	chlorobenzene-d5	47.7
559SB02501RE	chlorobenzene-d5	49.8
559SB02502RE	chlorobenzene-d5	48.8
559SB02801RE	bromochloromethane	44.7
	1,4-difluorobenzene	40.5
	chlorobenzene-d5	35.8
559SB02802RE	1,4-difluorobenzene	34.5
	chlorobenzene-d5	18.6
559SB02901RE	chlorobenzene-d5	43.4

All non-detect results for the compounds quantitated on ISTD's with %R's less than 25% were rejected (R), and positive results were flagged as estimated (J). All positive and non-detect results for the compounds quantitated on the other ISTD's were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis for samples 559SB02501 and 559SB02801 were considered by the validator to be of preferable data quality to the reanalyses because of ISTD performances and holding times. The reanalyses of samples 559SB02502, 559SB02802 and 559SB02901 were considered by the validator to be of preferable data quality to the original analyses due to improved internal standard performances.

All non-detect results for the compounds quantitated on chlorobenzene-d5 were rejected (R) in samples 559SB02802 and 559SB02802RE. All non-detect results for 2-chloroethyl vinyl ether in all samples and blanks in this SDG were rejected (R) due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

### *SEMI-VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met. No action was required.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

#### III.) Calibration:

##### Initial Calibration:

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 6/06/96 on instrument P for hexachlorocyclopentadiene (46.0%). Since there were no positive results for this compound in the associated samples, no action was necessary.

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 6/07/96 on instrument V for hexachlorocyclopentadiene (36.4%). Since there were no positive results for this compound in the associated samples, no action was necessary.

##### Continuing Calibration:

The Percent Difference (%D) for 2,4-dinitrophenol (43.7%) exceeded the 25% QC limit for the standard analyzed on 6/13/96 at 09:46 on instrument J. The associated samples were field blanks, so no action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/12/96 at 10:01 on instrument P for 4-nitroaniline (26.8%) and 3,3'-dichlorobenzidine (35.0%). All positive and non-detect results for these compounds in associated samples 559SB02401RE, 559SB02501DL, 083SB01001 and 083SB01001RE were flagged as estimated (J) and (UJ).

#### IV.) Blanks:

##### Method Blanks:

Di-n-butylphthalate was detected at 2.0 ug/L in method blank SBLK5. Since the associated samples were field blanks, no action was required.

Field Blanks:

There were no positive detections in the deionized water or equipment rinsate blanks in this SDG. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of terphenyl-d14 (140%) exceeded the 18-137% QC limits for sample 559SB02401. Since only one base/neutral surrogate was outside the QC limits, no action was taken.

The Percent Recovery (%R) of 2-fluorophenol (17%) was below the 25-121% QC limits for sample 559SB02301. Since only one acid surrogate was outside the QC limits, no action was required.

The Percent Recoveries (%R's) of the following surrogates were below their respective QC limits for deionized water blank 559DB02301:

<u>Surrogate</u>	<u>%R</u>	<u>QC limits</u>
phenol-d5	2	10-94%
2-fluorophenol	1	25-121%
2,4,6-tribromophenol	3	10-123%

All results for the acid fraction of this blank, which consisted entirely of non-detects, were rejected (R) since the %R's were less than 10%. These blank results were not considered acceptable for use in blank evaluations.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

Sample 559SB02401 was analyzed in this SDG, while corresponding field duplicate sample 559CB02401 was analyzed in SDG 25775A. There were no calculable RPD's for this field duplicate pair. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

The internal standard area counts for the following compounds were below the 50-200% QC limits for the samples listed:

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
083SB01001	chrysene-d12	45.4
	perylene-d12	35.4

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
083SB01001RE	1,4-dichlorobenzene-d4	49.3
	phenanthrene-d10	43.2
	chrysene-d12	28.9
	perylene-d12	16.7
559SB02401	chrysene-d12	37.5
	perylene-d12	22.4
559SB02401RE	phenanthrene-d10	49.1
	chrysene-d12	35.6
	perylene-d12	25.4
559SB02501	chrysene-d12	35.0
	perylene-d12	19.5
559SB02501DL	chrysene-d12	43.0
	perylene-d12	33.3

All non-detect results for the compounds quantitated on perylene-d12 in samples 559SB02401, 559SB02501 and 083SB01001RE were rejected (R), and all positive results were flagged as estimated (J) because the %R's were less than 25%. All positive and non-detect results for the compounds associated with the other ISTD's were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

The results for four compounds in sample 559SB02501 were greater than the instrument's calibration range. These results were replaced by the validator with the dilution results, with appropriate flagging. All other CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 083SB01001 and 559SB02401 were considered by the validator to be of preferable data quality to the reanalysis because of better internal standards performances and holding times. All acid fraction compound results were rejected in the original analysis of deionized water blank 559DB02301. The reanalysis of blank 559DB02301 was considered by the validator to be of preferable data quality to the original analysis since it yielded acceptable surrogate performance. A total of 13 non-detect results for the compounds quantitated on perylene-d12 were rejected (R) in samples 559SB02401, 559SB02501 and 083SB01001RE. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

The 16 days between sample date and extraction date for sample 559SB02301RE exceeded the 14 day QC limit for soil samples. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

II.) Instrument Performance:

The Relative Percent Differences (RPD's) exceeded the 25% QC limit for the standard analyzed on 6/13/96 at 20:01 on the primary column for the following compounds:

alpha-BHC	28.0%
gamma-BHC	28.0%
endrin	32.8%

All positive and non-detect results for these compounds in the soil samples for this SDG were flagged as estimated (J) and (UJ).

The Relative Percent Differences (RPD's) exceeded the 25% QC limit for the standard analyzed on 6/14/96 at 15:14 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
alpha-BHC	37.0%	-
gamma-BHC	29.0%	-
4,4'-DDT	54.4%	60.5%
methoxychlor	40.4%	44.4%

All positive and non-detect results for these compounds in the soil samples in this SDG were flagged as estimated (J) and (UJ).

The Percent Breakdowns (%B's) of 4,4'-DDT in the standard analyzed on 6/14/96 at 15:15 on the primary (38.2%) and secondary (36.3%) columns exceeded the 20% QC limit. The results for this compound in the associated samples were previously flagged. No further action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 6/14/96 at 04:47 on the primary column for 4,4'-DDD (27.1%). All positive and non-detect results for this compound in associated samples 559SB02401, 559SB02402, 559SB02501, 559SB02502, 559SB02801, 559SB02802, 559SB02901 and 559SB02902 were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 6/14/96 at 05:17 on the primary column for endrin aldehyde (28.1%). All positive and non-detect results for this compound in associated samples 559SB02401, 559SB02402, 559SB02501, 559SB02502, 559SB02801, 559SB02802, 559SB02901 and 559SB02902 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/14/96 at 15:45 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
alpha-BHC	28.9%	-
gamma-BHC	26.9%	-
4,4'-DDD	46.6%	-
4,4'-DDT	55.7%	63.1%
methoxychlor	37.9%	41.6%

Results for these compounds in associated samples 559SB02401, 559SB02402, 559SB02501, 559SB02502, 559SB02801, 559SB02802, 559SB02901 and 559SB02902 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/19/96 at 06:31 on the secondary column for the following compounds:

gamma-BHC	25.3%
heptachlor	26.2%
dieldrin	25.5%
endrin	31.6%
4,4'-DDT	46.9%
methoxychlor	27.8%

All positive and non-detect results for these compounds in associated sample 559SB02301RE were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/19/96 at 07:00 on the secondary column for the following compounds:

beta-BHC	25.2%
endosulfan II	28.5%
endrin ketone	23.6%
endrin aldehyde	30.0%
alpha chlordane	27.2%

All positive and non-detect results for these compounds in associated sample 559SB02301RE were flagged as estimated (J) and (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blanks:

There were no positive detections in the deionized water and equipment rinsate blanks. No action was necessary.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of surrogates were outside the 30-150% QC limits for the following samples:

Client Sample #	TCX, %R Column 1	TCX, %R Column 2	DCB, %R Column 1	DCB, %R Column 2
083SB01001	-	-	182	-
559SB02301	4	2	26	13
559SB02302	-	-	185	-
559SB02301RE	-	-	219	-

TCX = tetrachloro-m-xylene, DCB = decachlorobiphenyl

The results for sample 559SB02301, which consisted entirely of non-detects, were rejected (R). All positive results for the other three samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

Five LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) for endrin aldehyde (25%) exceeded the 20% QC limit. The non-detect result for this compound in associated unspiked sample 559SB02501 was flagged as estimated (UJ).

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Differences (%D's) between columns 1 and 2 exceeded the 70% QC limit for the following compounds and associated samples:

Sample	Compound	%D
559SB02302DL	4,4'-DDE	201
559SB02302	4,4'-DDE	248
559SB02502	gamma chlordane	100

The laboratory reported the result for 4,4'-DDE in 559SB02302DL as a non-detect. The other two associated positive sample results were flagged as estimated (J).

IX.) Field Duplicates:

The calculable Relative Percent Difference (RPD) for 4,4'-DDT (50%) was within the 60% QC limit for soil samples for field duplicate samples 559SB02401 and 559CB02401 (analyzed in SDG 25775A). No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

The reanalysis of sample 559SB02301 was considered by the validator to be of preferable data quality to the original analysis due to better Surrogate Recoveries.

All results for sample 559SB02301, which consisted entirely of non-detects, were rejected because of very low Surrogate %R's. All other laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank ID #</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
559EB02301	aluminum	103 ug/L	103 mg/kg
559DB02301	barium	184 ug/L	184 mg/kg
559DB02301	calcium	2240 ug/L	2240 mg/kg
559EB02301	iron	21.8 ug/L	21.8 mg/kg
559DB02301	lead	5.20 ug/L	5.20 mg/kg
559DB02301	magnesium	265 ug/L	265 mg/kg
559DB02301	manganese	13.8 ug/L	13.8 mg/kg

<u>Blank ID #</u>	<u>Analyte</u>	<u>Max Conc.</u>	<u>Action Level</u>
559DB02301	potassium	2090 ug/L	2090 mg/kg
559DB02301	sodium	28200 ug/L	28200 mg/kg
559DB02301	zinc	10.4 ug/L	10.4 mg/kg

DB = Deionized Blank, EB = Equipment Blank

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

IV.) ICP Interference Check Sample Results:

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

Copper (13 ug/L) was detected in ICS Solution A at a concentration greater than the IDL. This analyte should not be present. Additionally, negative results were observed for antimony (-41 ug/L), manganese (-9 ug/L) and nickel (12 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) for arsenic (11.4%), calcium (10.1), iron (13.0), manganese (12.1%), nickel (25.2%), tin (10.1) and zinc (15.0%) exceeded the 10 % QC limit. All positive results for these analytes in the soil samples in this SDG were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

The Relative Percent Differences (RPD's) exceeded the 35% QC limit for soil samples for copper (99.2), iron (41.5%), lead (51.6), nickel (49.4%), tin (36.9%) and zinc (98.1%) in sample 559SB02501MD. All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike Analysis (MS):

The Percent Recoveries (%R's) were below the 75-125% QC limits for sample 559SB02501MS for antimony (55.6), lead (30.4%), manganese (49.5%) and nickel (73.4%). All positive and non-detect results for these analytes in the associated soil samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Sample 559SB02401 was analyzed in this SDG, while field duplicate sample 559CB02401 was analyzed in SDG 25775A. The calculable Relative Percent Differences (RPD's) were:

Analyte	559SB02401, mg/kg	559CB02401, mg/kg	RPD
aluminum	4120	5210	23.3
arsenic	4.2	6.1	36.8
cadmium	2.5	2.7	7.7
calcium	26800	40900	41.6
chromium	10.2	13.0	24.1
copper	44.3	52.0	16.0
iron	3250	4460	31.3
lead	70.1	90.2	25.1
magnesium	764	1410	59.4
manganese	21.6	30.9	35.4
mercury	0.12	0.16	28.6
nickel	6.8	10.0	38.1
selenium	0.8	0.73	9.2
vanadium	7.4	10.1	30.9
zinc	97.8	128	26.7
tin	7.2	9.6	28.6

No action was required, since all RPD's were within the 60% QC limit for soil samples.

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:

All laboratory data were acceptable with qualifications.

*ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC/MS Tuning:

All GC/MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) of tetrabutyltin (0.028) and dibutyltin (0.048) were below the 0.050 QC limit for the standards analyzed on 6/18/96 on instrument J. The results for these compounds in the soil samples in this SDG, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) for tetrabutyltin (0.035) was below the 0.050 QC limit for the standard analyzed on 6/18/96 at 17:39 on instrument J. The results for this compound in the associated samples were previously rejected based on the initial calibration. No further action was taken.

The Percent Difference (%D) for tributyltin was 26.6%, which exceeded the 25% QC limit for the standard analyzed on 6/18/96 at 17:39 on instrument J. The results for this compound in the associated soil samples in this SDG, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the associated method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for tetrabutyltin and dibutyltin in the samples in this SDG were rejected (R) due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

# 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: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0060  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Soil  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NO: 25805A (Level IV)

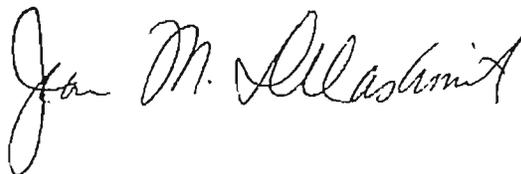
### SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/</u> <u>PCDF</u>
559CB02701	25805.01	Soil	X
605CB01201	25824.01	Soil	X
605CB01401	25824.02	Soil	X

C = FIELD DUPLICATE (Soil)

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 25805A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 559CB02701, 605CB01201, 605CB01401

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was required.

Calibration Verifications:

The Percent Difference (%D) of 13C-123478-HxCDF was 35.2% for the ending calibration verification run on 6/14/96 on instrument AutoSpec, which exceeded the 35.0% QC limit. All associated positive results in associated samples 559CB02701 and 605CB01201 were flagged as estimated (J).

IV.) Blanks:

Method Blanks:

One 2,3,7,8-substituted PCDF was detected in method blanks at the following concentration:

Method <u>Blank ID</u>	<u>Compound</u>	Conc. <u>ng/kg</u>	Action Level <u>ng/kg</u>
DFBLK1	1234678-HpCDF	0.34	1.7

Positive results for this compound in the associated samples were greater than 5X the blank amount, so no action was required.

Field Blanks:

No field blanks were analyzed in this SDG. No action was taken.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD's were analyzed in this SDG. No action was taken.

Two LCS samples were analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

The samples corresponding to field duplicate samples 559CB02701, 605CB01201 and 605CB01401 were not analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Upon validation, laboratory "X" flags (meaning "EMPC") were removed from all method blanks and were replaced with "EMPC" for all samples results.

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0060  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRICES: Soil and Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Chlorinated Herbicides, Organophosphorus Pesticides, Total Metals and Cyanide, Hexavalent Chromium, Organotin  
SDG NUMBERS: 25805A (Appendix IX, Level IV)  
25805B (Level III)

### SAMPLES:

#### SDG 25805A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
559CB02701*	25805.01	Soil	X	X	X	X
605CB01201*	25824.01	Soil	X	X	X	X
605CB01401*	25824.02	Soil	X	X	X	X
559CB02701RE	25805.01RE	Soil	+			
559CB02701DL	25805.01DL	Soil			+	
605CB01201RE	25824.01RE	Soil		+		
605CB01401RE	25824.02RE	Soil		+		

Client Sample#	Lab Sample #	Matrix	Chlorinated Herbicides	Organophos. Pesticides	Hexavalent Chromium	Organotin
559CB02701	25805.01	Soil	X	X	X	
605CB01201*	25824.01	Soil	X	X	X	X
605CB01401*	25824.02	Soil	X	X	X	X

+ = Non-billable DL or RE sample

\* = Field duplicate samples were associated with samples 559SB02701, 605SB01201 and 605SB01401 in SDG 25805B.

CB = FIELD DUPLICATE, DL = DILUTION, RE = REANALYSIS

SDG 25805B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
559SB02701*	25819.01	Soil	X	X	X	X
559SB02702	25819.02	Soil	X	X	X	X
566SB00601	25819.03	Soil	X	X	X	X
566SB00602	25819.04	Soil	X	X	X	X
566SB00701	25819.05	Soil	X	X	X	X
566SB00702	25819.08	Soil	X	X	X	X
583SB00801	25819.09	Soil	X	X	X	X
583SB00802	25819.10	Soil	X	X	X	X
605SB01201*	25823.01	Soil	X	X	X	X
605SB01202	25823.02	Soil	X	X	X	X
605SB01301	25823.09	Soil	X	X	X	X
605SB01401*	28523.05	Soil	X	X	X	X
605SB01402	25823.06	Soil	X	X	X	X
605SB01501	25823.12	Soil	X	X	X	X
605SB01502	25823.15	Soil	X	X	X	X
583TB00802	25819.11	Water	X			
605TB01602	25823.16	Water	X			
566SB00601RE	25819.03RE	Soil	+	+		
566SB00602RE	25819.04RE	Soil		+		
559SB02701RE	25819.01RE	Soil		+		
559SB02701DL	25819.01DL	Soil			+	
559SB02702RE	25819.02RE	Soil		+		
559SB02702DL	25819.02DL	Soil			+	
605SB01301RE	25823.09RE	Soil		+		
605SB01502RE	25823.15RE	Soil		+		
566SB00701MS	25819.05MS	Soil	+	+		
566SB00701MSD	25819.05MSD	Soil	+	+		
605SB01202MS	25823.02MS	Soil		+		
605SB01202MSD	25823.02MSD	Soil		+		
605SB01301MS	25823.09MS	Soil			+	
605SB01301MSD	25823.09MSD	Soil			+	
605SB01501MS	25823.12MS	Soil				+
605SB01501MD	25823.12MD	Soil				+

Client Sample #	Lab Sample #	Matrix	Organotin
605SB01201*	25823.01	Soil	X
605SB01202	25823.02	Soil	X

Client Sample #	Lab Sample #	Matrix	Organotin
605SB01301	25823.09	Soil	X
605SB01401*	25823.05	Soil	X
605SB01402	25823.06	Soil	X
605SB01501	25823.12	Soil	X
605SB01502	25823.15	Soil	X
605SB01202MS	25823.02MS	Soil	+
605SB01202MSD	25823.02MSD	Soil	+

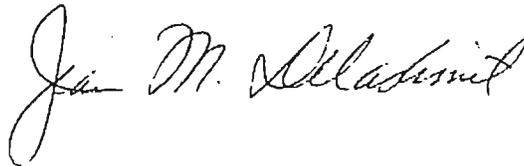
+ = Non-billable DL, RE or Quality Control sample

\* = Samples were associated with field duplicate samples 559CB02701, 605CB01201 and 605CB01401 in SDG 25805A.

DL = DILUTION, MS = MATRIX SPIKE, MD = MATRIX DUPLICATE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, TB = TRIP BLANK

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

RELEASE SIGNATURE:



## Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 25805A Appendix IX, CLP Organics and Inorganics

SAMPLES: 559CB02701, 559CB2701DL, 559CB02701RE, 605CB01201, 605CB1201RE,  
605CB01401, 605CB1401RE

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factors (RRF's) for acrolein (0.034), isobutyl alcohol (0.007), acetonitrile (0.026) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards analyzed on 2/1/96 on instrument C. The results for these compounds in samples 559CB02701, 605CB01201 and 605CB01401, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/1/96 on instrument C for the following compounds:

bromoethane	31.2%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%
isobutyl alcohol	48.6%
dibromomethane	32.1%
chloroprene	30.7%
acrylonitrile	31.2%
propionitrile	30.9%
methacrylonitrile	30.6%
1,4-dioxane	35.2%
1,2-dibromoethane	30.2%
1,2,3-trichloropropene	32.1%

The non-detect results for 1,4-dioxane and isobutyl alcohol were previously rejected based on low RRF's. The other compounds were not detected in the associated samples, so no further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRF's) for 2-chloroethyl vinyl ether (0.047), acrolein (0.015), acetonitrile (0.023), isobutyl alcohol (0.009) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards analyzed on 6/03/96 at 10:54 on instrument C. The non-detect result for 2-chloroethyl vinyl ether in associated sample 559CB02701 was rejected (R). The results for the other compounds in this sample were previously rejected based on the initial calibration.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/03/96 at 10:54 on instrument C for the following compounds:

2-chloroethyl vinyl ether	57.7%
acrolein	55.9%
isobutyl alcohol	28.6%
bromomethane	27.0%
chloroethane	34.3%
acetone	32.1%
vinyl acetate	68.5%
methyl iodide	57.2%
chloroprene	31.1%
trans-1,4-dichloro-2-butene	36.7%
pentachloroethane	36.5%
methacrylonitrile	37.5%
methyl methacrylate	45.5%
ethyl methacrylate	60.4%
1,2-dibromoethane	44.1%
1,1,1,2-tetrachloroethane	55.4%
1,2,3-trichloropropane	57.3%
1,2-dibromo-3-chloropropane	64.3%

The results for 2-chloroethyl vinyl ether, acrolein and isobutyl alcohol in associated sample 559CB02701 were previously rejected (R). The results for the other compounds in this sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factors (RRF's) for 2-chloroethyl vinyl ether (0.041), acrolein (0.041), acetonitrile (0.020), propionitrile (0.045), isobutyl alcohol (0.005) and 1,4-dioxane (0.001) were below the 0.050 QC limit for the standards analyzed on 6/07/96 at 09:56 on instrument C. The non-detect results for 2-chloroethyl vinyl ether and propionitrile in associated samples 605CB01201 and 605CB01401 were rejected (R). The associated results for the other compounds were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/07/96 at 09:56 on instrument C for the following compounds:

2-chloroethyl vinyl ether	63.1%
propionitrile	26.2%
isobutyl alcohol	28.6%
1,4-dioxane	50.0%
chloromethane	25.1%
chloroethane	25.8%
1,1,1-trichloroethane	32.7%
carbon tetrachloride	27.3%
vinyl acetate	31.7%
bromodichloromethane	32.3%
dibromochloromethane	34.1%
1,1,2-trichloroethane	28.5%
trans-1,3-dichloropropene	27.9%
bromoform	34.9%
2-hexanone	25.3%
tetrachloroethene	28.4%
1,1,2,2-tetrachloroethane	27.0%
chloroprene	31.5%
trans-1,4-dichloro-2-butene	29.7%
1,2-dibromoethane	31.1%
trichlorofluoromethane	75.2%
1,2-dibromo-3-chloropropane	36.7%

The results for 2-chloroethyl vinyl ether, propionitrile, 1,4-dioxane and isobutyl alcohol in associated samples 605CB01201 and 605CB01401 were previously rejected (R). The results for the other compounds in this sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the associated method blanks. No action was taken.

Trip Blanks:

Acetone and methylene chloride were detected at 4.0 ug/L and 1.0 ug/L, respectively, in associated trip blank 583TB00802 (analyzed in SDG 25805B). The positive result for methylene chloride in associated sample 559CB02701, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRDL. Acetone was not detected in the associated samples, so no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was necessary.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) were outside the QC

limits. Data validation action based on LCS recoveries was not required. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

Samples 559CB02701, 605CB01201 and 605CB01401 were analyzed in this SDG, while corresponding samples 559SB02701, 605SB01201 and 605SB01401 were analyzed in SDG 25805B. There were no calculable Relative Percent Differences (RPD's) for these duplicate sample pairs, so no action was taken.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of bromochloromethane (42.7%), 1,4-difluorobenzene (36.7%) and chlorobenzene-d5 (31.9%) were below the 50-200% QC limits for sample 559CB02701. All positive and non-detect results for this sample were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for 2-chloroethyl vinyl ether, acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in samples 559CB02701, 605CB01201 and 605CB01401 due to low RRF's in the initial and continuing calibrations. The non-detect results for propionitrile were rejected in samples 605CB01201 and 605CB01401 because of a low RRF in the continuing calibration. The original analysis of sample 559CB02701 was considered by the validator to be of preferable data quality to the reanalysis due to better surrogate recoveries, and therefore was selected for validation. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for aramite (0.028) and hexachlorophene (0.048) were below the 0.050 QC limit for the standards analyzed on 6/03/96 on instrument A. The non-detect results for these compounds in associated sample 559CB02701 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 6/03/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
n-nitrosomorpholine	33.4%
o-toluidine	30.2%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	33.9%
hexachloropropene	35.4%
p-phenylenediamine	38.1%
1,2,4,5-tetrachlorobenzene	31.3%
hexachlorocyclopentadiene	38.3%
1,4-napthaquinone	33.6%
1,3-dinitrobenzene	33.6%
dibenzofuran	34.7%
pentachloronitrobenzene	32.4%
1-napthylamine	35.9%
4-nitroquinoline-1-oxide	39.6%
2-napthylamine	33.8%
diphenylamine	31.6%
pentachlorophenol	35.8%
phorate	31.9%
4-aminobiphenyl	30.3%
pronamide	34.0%
pentachloronitrobenzene	47.1%

disulfoton	30.4%
methyl parathion	36.1%
parathion	39.1%
methapyrilene	41.2%
isodrin	34.9%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
7,12-dimethylbenz(a)anthracene	48.0%

These compounds were not detected in the associated samples, so no action was required.

The average Relative Response Factors (RRF's) for aramite (0.028) and hexachlorophene (0.048) were below the 0.050 QC limit for the standards analyzed on 6/13/96 on instrument A. The non-detect results for these compounds in associated samples 605CB01201 and 605CB01401 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 6/13/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
n-nitrosomorpholine	33.4%
o-toluidine	30.2%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	32.6%
hexachloropropene	35.9%
p-phenylenediamine	38.1%
1,2,4,5-tetrachlorobenzene	31.6%
1,4-napthaquinone	33.6%
1,3-dinitrobenzene	34.6%
pentachloronitrobenzene	35.4%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.6%
2-naphthylamine	33.8%
diphenylamine	31.6%
sulfotepp	35.8%
pentachlorophenol	35.8%
phorate	31.9%
4-aminobiphenyl	30.3%
pronamide	34.0%
pentachloronitrobenzene	47.1%
disulfoton	30.4%
methyl parathion	36.1%
parathion	39.1%

methapyrilene	41.2%
isodrin	34.9%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
7,12-dimethylbenz(a)anthracene	48.0%

These compounds were not detected in the associated samples, so no action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.039) and hexachlorophene (0.017) were below the 0.050 QC limit for the standards analyzed on 6/07/96 at 10:51 on instrument A. The non-detect results for these compounds were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/07/96 at 10:51 for the following compounds:

2,6-dichlorophenol	50.4%
hexachloropropene	82.4%
1,2,4,5-tetrachlorobenzene	50.1%
hexachlorocyclopentadiene	39.4%
pentachlorobenzene	40.0%
aramite	31.7%
methyl methanesulfonate	52.1%
n-nitrosomethylethylamine	56.8%
n-nitrosodiethylamine	58.0%
ethyl methanesulfonate	45.8%
2-picoline	50.8%
acetophenone	54.4%
n-nitrosopyrrolidine	52.2%
n-nitrosomorpholine	54.3%
o-toluidine	49.8%
1-nitroso-piperidine	56.3%
o,o,o-triethyl phosphorothionate	51.9%
n-nitroso-di-n-butylamine	48.8%
safrole	52.0%
isosafrole	42.8%
1,4-napthoquinone	41.6%
1,3-dinitrobenzene	58.9%
1-napthylamine	51.0%
2-napthylamine	56.5%
thionazin	58.2%
phorate	44.7%
phenacetin	59.7%
diallate	42.6%
dimethoate	73.8%

4-aminobiphenyl	48.7%
pronamide	50.4%
pentachloronitrobenzene	66.9%
disulfoton	32.7%
methyl parathion	67.7%
parathion	73.5%
methapyrilene	79.9%
isodrin	49.8%
chlorobenzilate	61.1%
3,3'-dimethylbenzidine	85.0%
famphur	180%
m-cresol	45.2%
4-nitroquinoline-1-oxide	93.4%
diphenylamine	36.9%
kepone	88.1%
7,12-dimethylbenz(a)anthracene	44.1%
hexachlorophene	64.0%
p-phenylenediamine	27.0%
1,3,5-trinitrobenzene	70.7%
a,a-dimethylbenz(a)anthracene	47.7%

The non-detect results for aramite and hexachlorophene were previously rejected based on low RRF's in the initial and continuing calibration. The results for the other compounds in associated sample 559CB02701, which consisted entirely of non-detects, were flagged as estimated (UJ).

The average Relative Response Factors (RRF's) for aramite (0.032) and hexachlorophene (0.024) were below the 0.050 QC limit for the standards analyzed on 6/18/96 at 10:51 on instrument A. The results for these compounds in the associated samples were previously rejected. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/18/96 at 10:51 on instrument A for the following compounds:

2,2'-oxybis(1-chloropropane)	30.0%
hexachloropropene	91.6%
1,2,4,5-tetrachlorobenzene	36.9%
pentachlorobenzene	45.1%
benzo(k)fluoranthene	41.2%
benzo(g,h,i)perylene	25.7%
pyridine	30.1%
methyl methanesulfonate	53.2%
n-nitrosomethylethylamine	38.2%
n-nitrosodiethylamine	51.3%
ethyl methanesulfonate	51.3%
2-picoline	33.4%
acetophenone	64.9%
n-nitrosopyrrolidine	75.8%
n-nitrosomorpholine	70.5%
o-toluidine	60.7%

1-nitroso-piperidine	52.4%
o,o,o-triethyl phosphorothionate	63.1%
n-nitroso-di-n-butylamine	54.8%
safrole	54.0%
isosafrole	37.4%
1,4-napthoquinone	44.7%
1,3-dinitrobenzene	42.0%
1-naphthylamine	52.5%
2-naphthylamine	46.7%
thionazin	54.3%
phorate	59.5%
phenacetin	35.4%
diallate	78.0%
dimethoate	51.5%
4-aminobiphenyl	42.7%
pronamide	61.3%
pentachloronitrobenzene	71.7%
disulfoton	39.8%
methyl parathion	41.1%
parathion	54.8%
methapyrilene	36.4%
isodrin	69.4%
chlorobenzilate	40.4%
3,3'-dimethylbenzidine	60.4%
famphur	96.1%
m-cresol	47.4%
diphenylamine	33.1%
kepone	63.7%
7,12-dimethylbenz(a)anthracene	63.9%
a,a-dimethylphenethylamine	39.6%
1,3,5-trinitrobenzene	70.7%
hexachlorophene	50.4%

The results for aramite and hexachlorophene were previously rejected. The positive and non-detect results for the other compounds in associated samples 605CB01201 and 605CB01401 were flagged as estimated (J) and (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the associated method blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of phenol-d5 (115%) and 2-fluorophenol (122%) exceeded their respective 24-113% and 25-121% QC limits for sample 605CB01201. there were no positive results for the acid fraction in this sample. No action was required.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS recoveries was not required, so no action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was necessary.

VIII.) Field Duplicates:

Samples 559CB02701, 605CB01201 and 605CB01401 were analyzed in this SDG, while corresponding samples 559SB02701, 605SB01201 and 605SB01401 were analyzed in SDG 25805B. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>559SB02701</u>	<u>559CB02701</u>	<u>RPD</u>
fluoranthene	540 ug/kg	700 ug/kg	25.8
<u>Compound</u>	<u>605SB01401</u>	<u>605CB01401</u>	<u>RPD</u>
naphthalene	450 ug/kg	430 ug/kg	4.5
fluoranthene	1000 ug/kg	1300 ug/kg	26.1
pyrene	1200 ug/kg	1000 ug/kg	18.2
benzo(a)anthracene	660 ug/kg	740 ug/kg	11.4
chrysene	1000 ug/kg	870 ug/kg	13.9
benzo(b)fluoranthene	1200 ug/kg	890 ug/kg	29.7
benzo(k)fluoranthene	970 ug/kg	1200 ug/kg	21.2
benzo(a)pyrene	820 ug/kg	850 ug/kg	3.6
indeno(1,2,3-cd)pyrene	530 ug/kg	620 ug/kg	15.6
benzo(g,h,i)perylene	550 ug/kg	640 ug/kg	15.1

All RPD's were within the 60% QC limit for soil samples. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene were rejected in the associated samples due to very low RRF's in the initial and continuing calibrations. The original analyses of samples 605CB01201 and 605CB01401 were considered by the validator to be of preferable data quality to the reanalyses due to better holding times. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Breakdown (%B) of 4,4'-DDT (23.2%) exceeded the 20% QC limit for the standards analyzed on 6/20/96 at 12:10 on the primary column. The results for this compound in all samples in this SDG were flagged as estimated (J).

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 6/20/96 at 12:41 on the primary column for 4,4'-DDT (28.1%) and on the secondary column for 4,4'-DDD (43.6%). All positive and non-detect results for these compounds in associated samples 605CB01201 and 605CB01401 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25 % QC limit for the standard analyzed on 6/19/96 at 06:31 on the secondary column for the following compounds:

gamma-BHC	25.3%
heptachlor	26.2%
dieldrin	25.5%
endrin	31.6%
4,4'-DDT	46.9%
methoxychlor	27.6%

The positive and non-detect results for these compounds in associated sample 559CB02701 were

flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25 % QC limit for the standard analyzed on 6/19/96 at 07:00 on the secondary column for the following compounds:

beta-BHC	25.2%
endosulfan II	28.5%
endrin ketone	26.3%
endrin aldehyde	30.0%
alpha chlordane	27.2%

The positive and non-detect results for these compounds in associated sample 559CB02701 were flagged as estimated (J) and (UJ).

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of DCB (152%) on the primary column exceeded the 30-150% QC limits for sample 559CB02701. All positive results for this sample were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples 559CB02701, 605CB01201 and 605CB01401 were analyzed in this SDG, while corresponding samples 559SB02701, 605SB01201 and 605SB01401 were analyzed in SDG 25805B. The calculable RPD's were:

<u>Compound</u>	<u>559SB02701</u>	<u>559CB02701</u>	<u>RPD</u>
heptachlor epoxide	2.1 ug/kg	1.5 ug/kg	33.3
4,4'-DDE	16 ug/kg	10 ug/kg	46.2
4,4'-DDD	10 ug/kg	4.5 ug/kg	75.9
4,4'-DDT	8.4 ug/kg	10 ug/kg	17.4
alpha chlordane	8.4 ug/kg	9.0 ug/kg	6.9
gamma chlordane	46 ug/kg	62 ug/kg	29.6

The positive results for 4,4'-DDD in these two samples were flagged as estimated (J) since the RPD exceeded the 60% QC limit for soil samples.

<u>Compound</u>	<u>605SB01201</u>	<u>605CB01201</u>	<u>RPD</u>
4,4'-DDT	30 ug/kg	28 ug/kg	6.9

No action was required, since the RPD was within the 60% QC limit for soil samples.

There were no calculable Relative Percent Differences (RPD's) for field duplicate pair 605CB01401 / 605SB01401, so no action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Difference (%D) between columns 1 and 2 for 4,4'-DDE in sample 559CB02701 was 232%, which exceeded the 70% QC limit. This result for 4,4'-DDE was flagged as estimated (J).

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

### *ORGANOPHOSPHORUS PESTICIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

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

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

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

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*CHLORINATED HERBICIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

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

IV.) Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

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

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
PBS1	copper	2.77 mg/kg	13.8 mg/kg
CCB2	iron	20.4 ug/L	20.4 mg/kg

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

All associated results were greater than 5X the blank amount (Action Level, mg/kg for soil samples). No action was required.

IV.) ICP Interference Check Sample Results:

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

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

antimony	171 ug/L
chromium	2 ug/L
copper	11 ug/L
thallium	15 ug/L
vanadium	16 ug/L
zinc	16 ug/L

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

Negative results were observed for barium (-2 ug/L), cadmium (-13 ug/L), manganese (-9 ug/L), nickel (-24 ug/L) and selenium (-7 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) exceeded the 10% QC limit for calcium (15.2%), iron (10.8%), lead (12.7%), magnesium (10.4%), manganese (10.1%) and selenium (201%). All positive results for these analytes in the soil samples for this SDG were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There were no Duplicate Sample Analyses in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spike samples analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Samples 559CB02701, 605CB01201 and 605CB01401 were analyzed in this SDG, while corresponding samples 559SB02701, 605SB01201 and 605SB01401 were analyzed in SDG 25805B. The calculable Relative Percent Differences (RPD's) for these samples were:

<u>Analyte</u>	<u>559SB02701, mg/kg</u>	<u>559CB02701, mg/kg</u>	<u>RPD</u>
aluminum	6360	5080	22.4
arsenic	16.4	14.4	12.9
calcium	115000	102000	12.0
chromium	31.2	27.7	11.9
cobalt	23.4	10.9	72.9
copper	57.1	41.5	31.6
iron	9900	6150	46.7
lead	65.4	57.2	13.4
magnesium	3450	2930	16.3
manganese	69.3	47.5	37.3
mercury	0.08	0.13	47.6
nickel	16.6	18.6	11.4
potassium	699	705	0.8
selenium	1.4	0.99	41.8
vanadium	20.2	18	11.5
zinc	267	169	45.0

The results for cobalt in these two samples were flagged as estimated (J) since the RPD exceeded the 60% QC limit for soil samples.

<u>Analyte</u>	<u>605SB01201, mg/kg</u>	<u>605CB01201, mg/kg</u>	<u>RPD</u>
aluminum	3710	4490	19.0
antimony	18.6	22.9	20.7
arsenic	14.9	11.8	23.2
barium	92.4	112	19.2
calcium	12200	8820	32.1
chromium	63.6	61.0	4.2
cobalt	30.6	36.1	16.5
copper	624	730	15.6
iron	16600	19500	16.1
lead	815	984	18.8
magnesium	807	819	1.5
manganese	178	167	6.4
mercury	0.15	0.29	63.6
nickel	201	270	19.9
vanadium	14.0	15.4	9.5
tin	180	225	22.2
zinc	2860	3180	10.6

The results for mercury were flagged as estimated (J) for these two samples, since the RPD exceeded the 60% QC limit for soil samples.

<u>Analyte</u>	<u>605SB01401, mg/kg</u>	<u>605CB01401, mg/kg</u>	<u>RPD</u>
aluminum	2170	2640	19.5
antimony	13.3	9.4	34.3
arsenic	16.9	31.4	60.0
barium	33.2	37.3	11.6
cadmium	1.1	1.2	8.7
calcium	9960	33600	109
chromium	33.5	30.5	9.3
copper	106	127	18.0
iron	11300	8160	32.3
lead	123	125	1.6
manganese	37.7	119	104
mercury	1.1	0.9	20.0
nickel	35	22.9	41.8
vanadium	21.1	14.6	36.4
tin	7.6	9.4	21.2
zinc	635	799	22.9

The results for calcium and manganese in these two samples were flagged as estimated (J), since their RPD's exceeded the 60% QC limit for soil samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. 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:

All laboratory data were acceptable with qualifications.

*HEXAVALENT CHROMIUM*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blank:

Hexavalent chromium was not detected in the method blank. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

Duplicate samples were not analyzed in this fraction. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples designated for this fraction. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualifications.

*ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factors (RRF's) for tetrabutyltin (0.028) and dibutyltin (0.048) were below the 0.050 QC limit for the standards analyzed on 6/18/96 on instrument J. The non-detect results for these compounds in the sample 605CB01201 were rejected (R).

The Average Relative Response Factor (RRF) of tetrabutyltin (0.037) was below the 0.050 QC limit for the standards analyzed on 6/19/96 on instrument J. The non-detect result for this compound in associated sample 605CB01401 was rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) for tetrabutyltin (0.035) was below the 0.050 QC limit for the standard analyzed on 6/18/96 at 17:39 on instrument J. The associated sample results for this compound were previously rejected based on the initial calibration. No further action was required.

The Percent Difference (%D) for tributyltin was 26.6%, which exceeded the 25% QC limit for the standard analyzed on 6/18/96 at 17:39 on instrument J. The results for this compound in the associated soil samples for this SDG, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the associated method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 605CB01201 and 605CB01401 and their associated samples, 605SB01201 and 605SB01401, which were analyzed in SDG 25805B. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) System Performance:

All System Performance criteria were met, so no action was taken.

XII.) Overall Assessment of Data/General:

The results for tributyltin were reported as "diesel 10-C22" in the electronic data. The spreadsheets matched the Form I's, reporting these data as "tributyltin". The electronic data identified as "diesel 10-C22" were renamed "tributyltin" during validation.

All non-detect sample results for tetrabutyltin were rejected (R) due to low RRF's in the initial calibration. The non-detect result for dibutyltin in sample 605CB01201 was rejected (R) due to a low RRF in the initial calibration. All other laboratory data were acceptable with qualifications.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 25805B Level III, CLP Organics and Inorganics

SAMPLES: 559SB02701, 559SB2701RE, 599SB2701DL, 559SB02702, 559SB2702RE,  
559SB2702DL, 566SB00601, 566SB601RE, 566SB00602, 566SB00602RE,  
566SB00701, 566SB00702, 583SB00801, 583SB00802, 605SB01201, 605SB01202,  
605SB01301, 605SB1301RE, 605SB01401, 605SB01402, 605SB01501, 605SB1502,  
605SB1502RE, 583TB00802, 605TB01602, 566SB0701MS, 566SB00701MSD,  
605SB01202MS, 605SB01202MSD, 605SB01301MS, 605SB01301MSD,  
605SB01501MS, 605SB01501MD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/01/96 on instrument C for the following compounds:

chloromethane	31.2%
bromomethane	30.5%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%

The positive results for acetone in associated samples 566SB00702, 605SB01202 and 605SB01502 were flagged as estimated (J). There were no other positive results for these compounds, so no further action was required.

The Average Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.046) was below the 0.050 QC limit for the standards analyzed on 4/29/96 on instrument R. The non-detect results for this compound in associated blanks 583TB00802 and 605TB01602 were rejected (R).

The Percent Relative Standard Deviation (%RSD's) exceeded the 30% QC limit for the standards analyzed on 4/29/96 on instrument R for the following compounds:

chloromethane	33.9%
bromomethane	39.4%
chloroethane	40.6%
methylene chloride	34.9%
acetone	75.1%
carbon disulfide	34.8%
1,2-dichloroethane	30.7%
2-butanone	39.1%
2-chloroethyl vinyl ether	73.0%

The results for 2-chloroethyl vinyl ether were previously rejected. There were no positive results for the other compounds in the associated blanks. No action was taken.

#### Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.047) was below the 0.050 QC limit for the standards analyzed on 6/03/96 at 10:54 on instrument C. The non-detect results for this compound in associated samples 559SB02702 and 566SB00601 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/03/96 at 10:54 on instrument C for the following compounds:

2-chloroethyl vinyl ether	57.7%
bromomethane	27.0%
chloroethane	34.3%
acetone	32.1%
vinyl acetate	68.5%

The results for 2-chloroethyl vinyl ether were previously rejected. The results for the other compounds in associated samples 559SB02702 and 566SB00601, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/05/96 at 14:18 on instrument C for the following compounds:

chloroethane	75.1%
vinyl acetate	61.6%
2-chloroethyl vinyl ether	53.2%

The results for these compounds in associated samples 559SB02701, 566SB00602, 566SB00701, 566SB00702, 583SB00801 and 583SB00802, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.041) was below the 0.050 QC limit for the standards analyzed on 6/07/96 at 09:56 on instrument C. The non-detect results for this

compound in associated samples 605SB01201, 605SB01202, 605SB01301, 605SB01401, 605SB01402, 605SB01501 and 605SB01502 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/07/96 at 09:56 on instrument C for the following compounds:

chloromethane	25.1%
chloroethane	25.8%
1,1,1-trichloroethane	32.7%
carbon tetrachloride	27.3%
vinyl acetate	31.7%
bromodichloromethane	32.3%
dibromochloromethane	34.1%
1,1,2-trichloroethane	28.5%
trans-1,3-dichloropropene	27.9%
bromoform	34.9%
2-chloroethyl vinyl ether	63.1%
2-hexanone	25.3%
tetrachloroethene	28.4%
1,1,2,2-tetrachloroethane	27.0%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. All other results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.016) was below the 0.050 QC limit for the standards analyzed on 6/04/96 at 11:17 on instrument R. The result for this compound in the associated sample was previously rejected. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for 2-chloroethyl vinyl ether (65.2%) and vinyl acetate (55.6%) for the standards analyzed on 6/04/96 at 11:17 on instrument R. Since the associated sample was a trip blank, no action was required.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.025) was below the 0.050 QC limit for the standards analyzed on 6/06/96 at 15:05 on instrument R. The result for this compound in the associated sample was previously rejected.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/06/96 at 11:17 on instrument R for 2-chloroethyl vinyl ether (45.7%), 1,2-dichloroethane (27.2%) and vinyl acetate (51.5%). Since the associated sample was a trip blank, no action was necessary.

#### IV.) Blanks:

##### Method Blanks:

Acetone was detected at 4 ug/L in water method blank VBLK2. Since the only associated sample was a trip blank, no action was necessary.

Methylene chloride was detected at 1 ug/L in water method blank VBLK4. Since the only associated sample was a trip blank, no action was necessary.

Trip Blanks:

Methylene chloride and acetone were detected at 1 ug/L and 4 ug/L, respectively, in trip blank 583TB00802. The positive detections of these compounds in associated samples 559SB02701, 559SB02702, 566SB00601, 566SB00602, 566SB00701, 566SB00702, 583SB00801 and 583SB00802 were not less than 10X the blank amounts. No action was necessary.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of toluene-d8 (132%) exceeded the 81-117% QC limits for sample 566SB00601. All positive results for this sample were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

Five LCS's were analyzed with this SDG. Several %R's were slightly outside the QC limits. Data validation action based on LCS recoveries was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

Samples 559SB02701, 605SB01201 and 605SB01401 were analyzed in this SDG, while field duplicate samples 559CB02701, 605CB01201 and 605CB01401 were analyzed in SDG 25805A. There were no calculable Relative Percent Differences (RPD's) for these duplicate sample sets, so no action was taken.

IX.) Internal Standards Performance (ISTD):

The ISTD Percent Recoveries (%R's) were below the 50-200% QC limits for the following sample:

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
566SB00601	bromochloromethane	36.7
	1,4-difluorobenzene	35.4
	chlorobenzene-d5	25.7

The results for compounds quantitated on these ISTD's were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample 566SB00601 was selected for validation because it was considered by the validator to be of preferable data quality to the reanalysis due to its better holding time. Eleven sample results for 2-chloroethyl vinyl ether were rejected due to low RRF's. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) exceeded the 25% QC limit for the standards analyzed on 6/19/96 on instrument P for hexachlorocyclopentadiene (35.4%). Since this compound was not detected in the associated samples, no action was required.

Continuing Calibration:

The Percent Differences (%D's) for 2,4-dinitrophenol (29.8%), dibenz(a,h)anthracene (27.1%) and benzo(g,h,i)perylene (29.3%) exceeded the 25% QC limit for the standard analyzed on 6/19/96 at 20:55 on instrument F. The results for these compounds in associated samples 605SB01201, 605SB01202, 605SB01301, 605SB01401, 605SB01402, 605SB01501 and 605SB01502, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the associated method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

Samples 559SB02701, 605SB01201 and 605SB01401 were analyzed in this SDG, while field duplicate samples 559CSB02701, 605CB01201 and 605CB01401 were analyzed in SDG 25805A. The calculable Relative Percent Differences (RPD's) were:

<u>Compound</u>	<u>559SB02701</u>	<u>559CB02701</u>	<u>RPD</u>
fluoranthene	540 ug/kg	700 ug/kg	25.8

<u>Compound</u>	<u>605SB01401</u>	<u>605CB01401</u>	<u>RPD</u>
naphthalene	450 ug/kg	430 ug/kg	4.5
fluoranthene	1000 ug/kg	1300 ug/kg	26.1
pyrene	1200 ug/kg	1000 ug/kg	18.2
benzo(a)anthracene	660 ug/kg	740 ug/kg	11.4
chrysene	1000 ug/kg	870 ug/kg	13.9
benzo(b)fluoranthene	1200 ug/kg	890 ug/kg	29.7
benzo(k)fluoranthene	970 ug/kg	1200 ug/kg	21.2
benzo(a)pyrene	820 ug/kg	850 ug/kg	3.6
indeno(1,2,3-cd)pyrene	530 ug/kg	620 ug/kg	15.6
benzo(g,h,i)perylene	550 ug/kg	640 ug/kg	15.1

There were no calculable RPD's for field duplicate pair 605SB01201 / 605CB01201. All RPD's were within the 60% QC limit for soil samples. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

The internal standard area counts were below the 50-200% QC limits for the following samples:

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
605SB01301	chrysene-d12	49.2
605SB01202	phenanthrene-d10	46.3
	chrysene-d12	34.1
	perylene-d12	42.9
	chrysene-d12	37.8
605SB01502	perylene-d12	47.9
	perylene-d12	34.1
559SB02701	perylene-d12	34.1

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
559SB02702	perylene-d12	41.0
566SB00601	chrysene-d12	30.8
	perylene-d12	16.1
566SB00602	chrysene-d12	38.8
	perylene-d12	17.8
566SB00701	chrysene-d12	38.3
	perylene-d12	18.6

The non-detect results for compounds quantitated on ISTD's with %R's was less than 25% were rejected (R), and the positive results were flagged as estimated (J). All positive and non-detect results for the compounds quantitated on the other ISTD's were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 605SB01502, 605SB01301, 559SB02701, 559SB02702, 566SB00601 and 566SB00602 were considered by the validator to be of preferable data quality to the reanalyses because of better Internal Standards Performances and holding times. These original analyses were selected for validation.

All non-detect results for the compounds quantitated on perylene-d12 were rejected (R) in samples 566SB00601, 566SB00602 and 566SB00701. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Breakdown (%B) of 4,4'-DDT (23.2%) exceeded the 20% QC limit for the standards analyzed on 6/20/96 at 12:10 on the primary column. The positive and non-detect results for this compound in all samples in this SDG were flagged as estimated (J).

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 6/20/96 at 12:41 on the primary column for 4,4'-DDD (28.1%). The results for this compound were previously flagged based on the instrument performance. No further action was required.

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 6/20/96 at 12:41 on the secondary column for 4,4'-DDD (43.6%). All positive and non-detect results for this compound in associated samples 605SB01501, 605SB01502, 605SB01201, 605SB01202, 605SB01401, 605SB01402 and 605SB01301 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/20/96 at 02:16 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
heptachlor	55.2%	49.0%
dieldrin	26.5%	-
endrin	30.9%	28.3%
4,4'-DDT	100%	100%
methoxychlor	100%	100%

The positive and non-detect results for these compounds in associated samples 559SB02701, 559SB02702, 566SB00601, 566SB00602, 566SB00701, 566SB00702, 583SB00801 and 583SB00802 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25 % QC limit for the standard analyzed on 6/20/96 at 02:46 on the primary column for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
endosulfan II	30.6%	-
endosulfan sulfate	28.5%	-
endrin ketone	74.5%	63.2%
endrin aldehyde	27.7%	30.0%

The positive and non-detect results for these compounds in associated samples 559SB02701, 559SB02702, 566SB00601, 566SB00602, 566SB00701, 566SB00702, 583SB00801 and 583SB00802

were flagged as estimated (J) and (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) were outside their QC limits for samples 605SB01301MS and 605SB01301MSD for the following compounds:

<u>Compound</u>	<u>MS, %R</u>	<u>MSD, %R</u>	<u>QC Limits</u>
endrin	214	248	25-138%
4,4'-DDT	215	226	54-131%
endrin aldehyde	0	0	27-160%

The positive result for 4,4'-DDT in unspiked sample 605SB01301 was flagged as estimated (J). The non-detect result for endrin aldehyde in this sample was rejected (R). Endrin was not detected in the sample. No further action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Difference (%D) between columns 1 and 2 for beta-BHC (121%) exceeded the 70% QC limit for sample 559SB02702. The associated sample result for this compound was flagged as estimated (J).

IX.) Field Duplicates:

Samples 559SB02701, 605SB01201 and 605SB01401 were analyzed in this SDG, while corresponding samples 559CB02701, 605CB01201 and 605CB01401 were analyzed in SDG 25805A. There were no calculable Relative Percent Differences (RPD's) for field duplicate pair 605CB01401 and 605SB01401, so no action was required. The following RPD's were calculated for the other pairs:

<u>Compound</u>	<u>559SB02701</u>	<u>559CB02701</u>	<u>RPD</u>
heptachlor epoxide	2.1 ug/kg	1.5 ug/kg	33.3
4,4'-DDE	16 ug/kg	10 ug/kg	46.2
4,4'-DDD	10 ug/kg	4.5 ug/kg	75.9
4,4'-DDT	8.4 ug/kg	10 ug/kg	17.4
alpha chlordane	8.4 ug/kg	9.0 ug/kg	6.9
gamma chlordane	46 ug/kg	62 ug/kg	29.6

The positive results for 4,4'-DDD in the two samples were flagged as estimated (J), since the RPD exceeded the 60% QC limit for soil samples. No further action was necessary.

<u>Compound</u>	<u>605SB01201</u>	<u>605CB01201</u>	<u>RPD</u>
4,4'-DDT	30 ug/kg	28 ug/kg	6.9

No action was required, since the RPD was within the 60% QC limit.

X.) Pesticide Cleanup Check:

Florisol Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

The results for gamma-chlordane in sample 559SB02701 and 4,4'-DDD in sample 559SB02702 were greater than the instrument's calibration range. These two results were replaced with the dilution results and flagged (D). The non-detect result for endrin aldehyde in sample 605SB01301 was rejected because of zero percent MS / MSD recoveries. All other laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB4	copper	10.8 ug/L	10.8 mg/kg
PBS	zinc	2.1 mg/kg	10.5 mg/kg

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

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

#### IV.) ICP Interference Check Sample Results:

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

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

antimony	171 ug/L
copper	11 ug/L
vanadium	16 ug/L
zinc	10 ug/L

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

Negative results were observed for cadmium (-13 ug/L), manganese (-9 ug/L) and nickel (-24 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

#### V.) ICP Serial Dilution Analysis:

The Percent Difference (%D) exceeded the 10% QC limit for zinc (10.1%) for serial dilution sample 605SB01501L. All positive results for zinc in the SDG soil samples were flagged as estimated (J).

#### VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

#### VII.) Duplicate Sample Analysis:

The Relative Percent Difference (RPD) of lead (64.3%) in sample 605SB01501MD exceeded the 35% QC limit for soil samples. All positive and non-detect results for lead in the samples in this SDG were flagged as estimated (J) and (UJ).

VIII.) Matrix Spike Analysis (MS):

The Percent Recoveries (%R's) of calcium (28%), chromium (62%), cobalt (68%), nickel (58%) and tin (60%) were below the 75-125% QC limits in sample 605SB01501MS. All positive and non-detect results for these analytes in the associated samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Samples 559SB02701, 605SB01201 and 605SB01401 were analyzed in this SDG, while field duplicate samples 559CB02701, 605CB01201 and 605CB01401 were analyzed in SDG 25805A. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>559SB02701, mg/kg</u>	<u>559CB02701, mg/kg</u>	<u>RPD</u>
aluminum	6360	5080	22.4
arsenic	16.4	14.4	12.9
calcium	115000	102000	12.0
chromium	31.2	27.7	11.9
cobalt	23.4	10.9	72.9
copper	57.1	41.5	31.6
iron	9900	6150	46.7
lead	65.4	57.2	13.4
magnesium	3450	2930	16.3
manganese	69.3	47.5	37.3
mercury	0.08	0.13	47.6
nickel	16.6	18.6	11.4
potassium	699	705	0.8
selenium	1.4	0.99	41.8
vanadium	20.2	18	11.5
zinc	267	169	45.0

All results for cobalt in these two samples were flagged as estimated (J) since the RPD exceeded the 60% QC limit for soil samples.

<u>Analyte</u>	<u>605SB01201, mg/kg</u>	<u>605CB01201, mg/kg</u>	<u>RPD</u>
aluminum	3710	4490	19.0
antimony	18.6	22.9	20.7
arsenic	14.9	11.8	23.2
barium	92.4	112	19.2
calcium	12200	8820	32.1
chromium	63.6	61.0	4.2
cobalt	30.6	36.1	16.5
copper	624	730	15.6
iron	16600	19500	16.1
lead	815	984	18.8
magnesium	807	819	1.5
manganese	178	167	6.4
mercury	0.15	0.29	63.6
nickel	201	270	19.9

<u>Analyte</u>	<u>605SB01201, mg/kg</u>	<u>605CB01201, mg/kg</u>	<u>RPD</u>
vanadium	14.0	15.4	9.5
tin	180	225	22.2
zinc	2860	3180	10.6

The results for mercury were flagged as estimated (J) for these two samples since the RPD exceeded the 60% QC limit for soil samples.

<u>Analyte</u>	<u>605SB01401, mg/kg</u>	<u>605CB01401, mg/kg</u>	<u>RPD</u>
aluminum	2170	2640	19.5
antimony	13.3	9.4	34.3
arsenic	16.9	31.4	60.0
barium	33.2	37.3	11.6
cadmium	1.1	1.2	8.7
calcium	9960	33600	109
chromium	33.5	30.5	9.3
copper	106	127	18.0
iron	11300	8160	32.3
lead	123	125	1.6
manganese	37.7	119	104
mercury	1.1	0.9	20.0
nickel	35	22.9	41.8
vanadium	21.1	14.6	36.4
tin	7.6	9.4	21.2
zinc	635	799	22.9

The results for calcium and manganese in these two samples were flagged as estimated (J), since their RPD's exceeded the 60% QC limit for soil samples.

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:

All laboratory data were acceptable with qualifications.

*ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factor (RRF) for tetrabutyltin (0.037) was below the 0.050 QC limit for the standards analyzed on 6/19/96 on instrument J. The non-detect results for this compound in the samples in this SDG were rejected (R).

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no positive detections in the associated method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples 605SB01201 and 605SB01401 and their associated samples, 605CB01201 and 605SC01401, which were analyzed in SDG 25805A. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Overall Assessment of Data/General:

The results for tributyltin were reported as "diesel 10-C22" in the electronic data. The spreadsheets matched the Form I's, reporting these data as "tributyltin". The electronic data also had the same data reported again as "miscellaneous C12-C28." The "miscellaneous C12-C28" line was deleted during validation. The electronic data identified as "diesel 10-C22" were renamed "tributyltin" during validation.

The non-detect results for tetrabutyltin in all samples in this SDG were rejected (R) due to the low RRF in the initial calibration. All other laboratory data were acceptable without qualifications.

# VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

(770) 923-3890

(770) 923-8769 (Fax)

## DATA VALIDATION SUMMARY REPORT

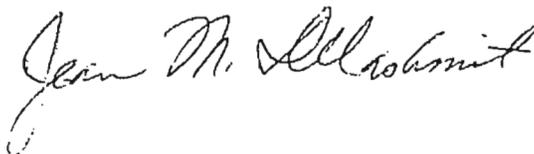
COMPANY: Ensafe/Allen & Hoshall  
SITE NAME: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0057  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994  
SAMPLE MATRIX: TCLP Leachate  
TYPES OF ANALYSES: Semivolatile Organics  
SDG NUMBER: 25839A (Level IV)

### SAMPLE:

Client	Lab	Matrix	Semivolatile
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>
574SB00501	25839.01	Leachate	X

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

RELEASE SIGNATURE:



## Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 25839A CLP TCLP Semivolatile Organics : -

SAMPLE: 574SB00501

### *TCLP SEMIVOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met. No action was required.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

#### III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 5/29/96 on instrument F for benzo(g,h,i)perylene (31.9%). This compound was not detected in the associated samples. No action was required.

Continuing Calibration:

The Percent Difference (%D) for benzo(g,h,i)perylene (27.7%) exceeded the 25% QC limit for the standard analyzed on 6/05/96 at 11:01 on instrument F. The non-detect result for this compound in associated sample 574SB00501 was flagged as estimated (UJ).

#### IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

TCLP Blank:

There were no positive detections in the TCLP blank. No action was required.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

# VALIDATA

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(770) 923-8769 (Fax)

## DATA VALIDATION SUMMARY REPORT

COMPANY: EnSafe/Allen & Hoshall  
SITE NAME: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0062  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Soil  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's  
  
SDG NO: 25846A (Level IV)

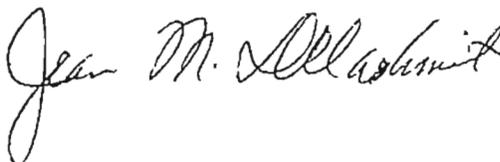
### SAMPLES:

<u>Client</u>	<u>Lab</u>	<u>Matrix</u>	<u>PCDD/ PCDF</u>
<u>Sample #</u> 561CB00601	<u>Sample #</u> 25859.01	Soil	X

C = FIELD DUPLICATE (Soil)

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon, Jean M. Delashmit

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 25859A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLE: 561CB00601

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was required.

Calibration Verifications:

The Percent Difference (%D) of 13C-123478-HxCDF was 35.2% for the ending calibration verification run on 6/14/96 on instrument AutoSpec, which exceeded the 35% QC limit. All associated positive results in sample 561CB00601 were flagged as estimated (J).

IV.) Blanks:

Method Blanks:

Several 2,3,7,8-substituted PCDD's and PCDF's were detected in the method blank at the following concentration:

<u>Method</u> <u>Blank ID</u>	<u>Compound</u>	<u>Conc.</u> <u>ng/kg</u>	<u>Action Level</u> <u>ng/kg</u>
DFBLK1	1234678-HpCDF	0.34	1.7

The result for this compound in the associated sample was greater than 5X the blank amount. No action was required.

Field Blanks:

No field blanks were analyzed.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD were analyzed in this SDG. No action was taken.

Two LCS samples were analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

The sample corresponding to field duplicate sample 561CB00601 was not analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Upon validation, laboratory "X" flags (meaning "EMPC") were removed from the method blank.

# VALIDATA

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(770) 923-8769 (Fax)

## DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall  
SITE NAME: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0062  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRICES: Soil and Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Chlorinated Herbicides, Organophosphorus Pesticides, Total Metals and Cyanide, Hexavalent Chromium  
SDG NUMBERS: 25846A (Appendix IX, Level IV)  
25846B (Level III)

### SAMPLES:

SDG 25846A (Level IV):

Client	Lab		Volatile	Semi-	Pesticides/	Metals/
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Cyanide</u>
561CB00601	25859.01	Soil	X	X	X	X

Client	Lab		Chlorinated	Organophos.	Hexavalent
<u>Sample#</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Herbicides</u>	<u>Pesticides</u>	<u>Chromium</u>
561CB00601*	25859.01	Soil	X	X	X

\* = Field duplicate was associated with sample 561SB00601 in SDG 25846B.

CB = FIELD DUPLICATE

SDG 25846B (Level III):

<u>Client Sample #</u>	<u>Lab Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Semi- volatiles</u>	<u>Pesticides/ PCB's</u>	<u>Metals/ Cyanide</u>
102SB03401	25846.01	Soil	X			
102SB03402	25846.02	Soil	X	X	X	X
102SB03402RE	25846.02RE	Soil		X		
102SB03501	25846.03	Soil	X			
102SB03502	25846.06	Soil	X	X	X	X
102SB03502RE	25846.06RE	Soil		X		
102SB03601	25846.07	Soil	X			
102SB03601RE	25846.07RE	Soil	X			
102SB03602	25846.08	Soil	X	X	X	X
102SB03602RE	25846.08RE	Soil	X	X		
102SB03701	25846.09	Soil	X			
102SB03701RE	25846.09RE	Soil	X			
102SB03702	25846.10	Soil	X	X	X	X
102SB03702RE	25846.10RE	Soil	X	X		
102SB04101	25858.01	Soil	X			
102SB04102	25858.02	Soil	X			
102SB04601	25858.03	Soil	X	X	X	X
102SB04602	25858.04	Soil	X	X	X	X
561SB00601*	25858.07	Soil	X	X	X	X
561SB00602	25858.10	Soil	X	X	X	X
596SB01301	25858.05	Soil	X	X	X	X
596SB01301RE	25858.05RE	Soil	X			
596SB01302	25858.06	Soil	X	X	X	X
102TB03702	25846.11	Water	X			
561TB00602	25858.11	Water	X			
102SB03501MS	25846.03MS	Soil	+			
102SB03501MSD	25846.03MSD	Soil	+			
561SB00601MS	25858.07MS	Soil		+		
561SB00601MSD	25858.07MSD	Soil		+		

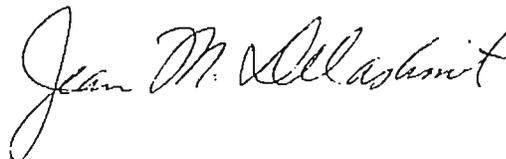
\* = Sample was associated with field duplicate sample 561CB00601 in SDG 25846A

+ = Non-billable Quality Control Sample

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS,  
T = TRIP BLANK

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

RELEASE SIGNATURE:



### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 25846A Appendix IX, CLP Organics and Inorganics

SAMPLE: 561CB00601

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for acrolein (0.034), isobutyl alcohol (0.007), acetonitrile (0.026) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards analyzed on 2/1/96 on instrument C. The results for these compounds in sample 561CB00601, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/1/96 on instrument C for the following compounds:

bromoethane	31.2%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%
isobutyl alcohol	48.6%
dibromomethane	32.1%
chloroprene	30.7%
acrylonitrile	31.2%
propionitrile	30.9%
methacrylonitrile	30.6%
1,4-dioxane	35.2%
1,2-dibromoethane	30.2%
1,2,3-trichloropropene	32.1%

The non-detect results for 1,4-dioxane and isobutyl alcohol were previously rejected based on low

RRF's. The other compounds were not detected in the sample, so no further action was necessary.

#### Continuing Calibration:

The Relative Response Factors (RRF's) for 2-chloroethyl vinyl ether (0.039), acrolein (0.039), isobutyl alcohol (0.005), propionitrile (0.042) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standard analyzed on 6/11/96 at 09:51 on instrument C. The non-detect results for 2-chloroethyl vinyl ether and propionitrile in associated sample 561CB00601 were rejected (R). The sample results for the other compounds in this sample were previously rejected. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/11/96 at 09:51 for the following compounds:

2-chloroethyl vinyl ether	64.9%
propionitrile	31.1%
isobutyl alcohol	28.6%
acetone	32.8%
vinyl acetate	48.8%
chloroprene	35.7%
trans-1,4-dichloro-2-butene	30.4%
acetonitrile	26.9%
1,2-dibromoethane	25.1%
trichlorofluoromethane	72.5%
1,2-dibromo-3-chloropropane	31.0%

The results for 2-chloroethyl vinyl ether, propionitrile, acetonitrile and isobutyl alcohol in the sample were previously rejected. The results for the other compounds in sample 561CB00601, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

There were no positive detections in the method blank. No action was taken.

##### Trip Blanks:

Acetone and methylene chloride were detected at 5.0 ug/L and 4.0 ug/L, respectively, in associated trip blank 561TB00602 (analyzed in SDG 25846B). There were no positive results for these compounds less than 10X the blank results in the associated sample. No action was required.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was necessary.

#### VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VIII.) Field Duplicates:

Sample 561CB00601 was analyzed in this SDG, while corresponding sample 561SB00601 was analyzed in SDG 25846B. There were no calculable Relative Percent Differences (RPD's) for this duplicate sample pair, so no action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for 2-chloroethyl vinyl ether, propionitrile, acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample 561CB00601 due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factor (RRF) for aramite (0.030) was below the 0.050 QC limit for the standards analyzed on 5/08/96 on instrument A. The non-detect result for this compound in associated sample 561CB00601 was rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 5/08/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
n-nitrosomorpholine	33.4%
o-toluidine	37.3%
1-nitroso-piperidine	35.0%
o,o,o-triethyl phosphorothionate	35.1%
2,6-dichlorophenol	33.6%
hexachloropropene	32.8%
n-nitroso-di-n-butylamine	32.9%
1,2,4,5-tetrachlorobenzene	34.7%
safrole	33.6%
isosafrole	32.8%
1,4-napthaquinone	33.6%
1,3-dinitrobenzene	34.7%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.5%
2-naphthylamine	35.1%
thionazin	36.9%
2-methyl-5-nitroaniline	35.7%
diphenylamine	31.5%
sulfotepp	35.8%
phorate	36.4%
phenacetin	33.3%
diallate	35.0%
dimethoate	37.6%
4-aminobiphenyl	32.0%
1,3,5-trinitrobenzene	31.8%
pronamide	33.9%
pentachloronitrobenzene	34.9%
disulfoton	37.7%
methyl parathion	36.4%
parathion	39.1%
methapyrilene	41.3%

isodrin	34.9%
chlorobenzilate	39.3%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
2-acetylaminofluorene	35.4%
7,12-dimethylbenz(a)anthracene	47.9%

These compounds were not detected in the associated samples, so no action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.030) and hexachlorophene (0.014) were below the 0.050 QC limit for the standards analyzed on 6/11/96 at 12:11 on instrument A. The non-detect result for hexachlorophene in associated sample 561CB00601 was rejected (R). The non-detect result for aramite was previously rejected based on the initial calibration.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/11/96 at 12:11 for the following compounds:

pyridine	52.0%
n-nitrosodimethylamine	33.0%
methyl methanesulfonate	47.1%
n-nitroso-di-n-propylamine	29.3%
acetophenone	41.1%
n-nitrosopyrrolidine	34.3%
n-nitroso-di-n-butylamine	27.7%
safrole	71.6%
isosafrole	54.8%
1,4-napthoquinone	59.6%
thionazin	42.8%
phorate	36.1%
dimethoate	43.8%
pronamide	63.5%
pentachloronitrobenzene	60.1%
disulfoton	43.0%
methapyrilene	47.0%
chlorobenzilate	27.3%
3,3'-dimethylbenzidine	32.0%
3,3'-dichlorobenzidine	38.0%
m-cresol	66.3%
diphenylamine	51.5%
sulfotep	28.5%
kepone	136%
7,12-dimethylbenz(a)anthracene	67.2%
hexachlorophene	71.9%
p-phenylenediamine	33.1%
1,3,5-trinitrobenzene	49.4%

The non-detect result for hexachlorophene was previously rejected based on a low RRF in this continuing calibration. The results for the other compounds in associated sample 561CB00601, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the associated method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was necessary.

VIII.) Field Duplicates:

Sample 561CB00601 was analyzed in this SDG, while corresponding sample 561SB00601 was analyzed in SDG 25846B. There were no calculable RPD's for this duplicate sample pair. No action was taken.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene were rejected in the associated sample due to very low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/27/96 at 19:04 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
gamma-BHC	27.8%	-
heptachlor	42.0%	-
endosulfan I	48.0%	30.5%
dieldrin	42.5%	-
endrin	46.9%	25.3%
4,4'-DDT	79.8%	73.9%
methoxychlor	69.9%	56.6%

The results for these compounds in associated sample 561CB00601, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/27/96 at 19:34 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
beta-BHC	29.0%	-
delta-BHC	33.1%	-
aldrin	35.9%	-
heptachlor epoxide	44.2%	-

<u>Compound</u>	<u>%D. Column 1</u>	<u>%D. Column 2</u>
4,4-DDE	35.9%	-
endosulfan sulfate	40.9%	-
endrin ketone	46.4%	27.4%
endrin aldehyde	44.9%	33.8%
alpha chlordane	44.4%	25.9%
gamma chlordane	41.1%	25.8%

The results for these compounds in associated sample 561CB00601, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) were below the 30-150% QC limits for DCB on the primary column (7.0%) and secondary column (5.0%) for sample 561CB00601. All results for this sample, which consisted entirely of non-detects, were rejected (R) since the %R's were less than 10%.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

Sample 561CB00601 was analyzed in this SDG, while corresponding sample 561SB00601 was analyzed in SDG 25846B. There were no calculable Relative Percent Differences (RPD's) for this field duplicate pair, so no action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All results for sample 561CB00601, which consisted entirely of non-detects, were rejected because of Surrogate Recoveries of less than 10%.

*ORGANOPHOSPHORUS PESTICIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

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

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

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

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses associated with this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples for this fraction of the SDG. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*CHLORINATED HERBICIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Herbicide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

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

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

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

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB2	iron	20.4 ug/L	20.4 mg/kg
CCB3	silver	2.30 ug/L	2.30 mg/kg

CCB = Continuing Calibration Blank

Silver was not detected in the associated sample. The associated sample result for iron was greater than 5X the blank amount. No action was required.

IV.) ICP Interference Check Sample Results:

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

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

antimony	8 ug/L
chromium	2 ug/L
thallium	8 ug/L

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

Negative results were observed for barium (-2 ug/L), manganese (-4 ug/L), selenium (-7 ug/L), vanadium (-3 ug/L) and zinc (-6 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

There were no Serial Dilution samples analyzed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There was no Duplicate Sample Analysis in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spikes analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Sample 561CB00601 was analyzed in this SDG, while corresponding sample 561SB00601 was analyzed in SDG 25846B. The Relative Percent Differences (RPD's) for calcium and mercury in these two samples exceeded the 60% QC limit for soil samples. The positive results for these two analytes in the duplicate samples were flagged as estimated (J). Refer to SDG 25846B for RPD tabulations.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. 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:

All laboratory data were acceptable with qualifications.

*HEXAVALENT CHROMIUM*

I.) Holding Times:

The 15 days between sample date and extraction date for sample 561CB00601 grossly exceeded the 24 hour QC limit. The non-detect result for this sample was rejected (R).

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blank:

Hexavalent chromium was not detected in the method blank. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

Duplicate samples were not analyzed in this fraction. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples designated for this fraction. No action was taken.

VIII.) Overall Assessment of Data/General:

The non-detect result for hexavalent chromium in sample 561CB00601 was rejected (R) due to excessive holding time.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 25846B Level III, CLP Organics and Inorganics

SAMPLES: 102SB03401, 102SB03402, 102SB03402RE, 102SB03501, 102SB03502, 102SB03502RE, 102SB03601, 102SB03601RE, 102SB03602, 102SB03602RE, 102SB03701, 102SB03701RE, 102SB03702, 102SB03702RE, 102SB04101, 102SB04102, 102SB04601, 102SB04602, 561SB00601, 561SB00602, 596SB01301, 596SB01301RE, 596SB01302, 102TB03702, 561TB00602, 102SB03501MS, 102SB03501MSD, 561SB00601MS, 561SB00601MSD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/01/96 on instrument C for the following compounds:

chloromethane	31.2%
bromomethane	30.5%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%

The positive results for acetone in associated samples 102SB04601 and 596SB01301 were flagged as estimated (J). Since all other associated results for these compounds were non-detects, no further action was required.

The Average Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.046) was below the 0.050 QC limit for the standard analyzed on 4/29/96 on instrument R. The non-detect results for this compound in associated blanks 102TB03702 and 561TB00602 were rejected (R).

The Percent Relative Standard Deviation (%RSD's) exceeded the 30% QC limit for the standards analyzed on 4/29/96 on instrument R for the following compounds:

chloromethane	33.9%
bromomethane	39.4%
chloroethane	40.6%
methylene chloride	34.9%
acetone	75.1%
carbon disulfide	34.8%
1,2-dichloroethane	30.7%
2-butanone	39.1%
2-chloroethyl vinyl ether	73.0%

The results for 2-chloroethyl vinyl ether were previously rejected. There were no positive results for the other compounds in the associated samples. No further action was taken.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.041) was below the 0.050 QC limit for the standards analyzed on 6/07/96 at 09:56 on instrument C. The non-detect result for this compound in associated sample 102SB03402 was rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/07/96 at 09:56 on instrument C for the following compounds:

chloromethane	25.1%
chloroethane	25.8%
1,1,1-trichloroethane	32.7%
carbon tetrachloride	27.3%
vinyl acetate	31.7%
bromodichloromethane	32.3%
dibromochloromethane	34.1%
1,1,2-trichloroethane	28.5%
trans-1,3-dichloropropene	27.9%
bromoform	34.9%
2-chloroethyl vinyl ether	63.1%
2-hexanone	25.3%
tetrachloroethene	28.4%
1,1,2,2-tetrachloroethane	27.0%

The non-detect result for 2-chloroethyl vinyl ether in sample 102SB03402 was previously rejected. All other results for these compounds in the associated sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.039) was below the 0.050 QC limit for the standards analyzed on 6/11/96 at 09:51 on instrument C. The non-detect result for this compound in associated samples 102SB03401, 102SB03501, 102SB03502, 102SB03601, 102SB03602, 102SB03701, 102SB03702, 103SB04101, 102SB04102, 102SB04601, 596SB01301, 561SB00601 and 561SB00602 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/11/96 at

09:51 on instrument C for the following compounds:

acetone	32.8%
vinyl acetate	48.8%
2-chloroethyl vinyl ether	64.9%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected (R). The positive and non-detect results for the other two compounds in the associated samples were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/12/96 at 14:52 on instrument C for the following compounds:

bromomethane	26.0%
chloroethane	26.4%
1,1,1-trichloroethane	30.3%
carbon tetrachloride	27.2%
vinyl acetate	55.1%
dibromochloromethane	27.8%
bromoform	25.7%
tetrachloroethene	26.9%
2-chloroethyl vinyl ether	42.3%

The results for these compounds in associated samples 102SB03601RE, 102SB03602RE, 102SB03701RE, 102SB03702RE, 102SB04602, 596SB01301RE and 596SB01302, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) of 2-chloroethyl vinyl ether (0.022) was below the 0.050 QC limit for the standards analyzed on 6/10/96 at 10:11 on instrument R. The results for this compound in the associated samples were previously rejected.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/10/96 at 10:11 on instrument R for 2-chloroethyl vinyl ether (52.2%). The results for this compound in the associated samples were previously rejected. No further action was required.

IV.) Blanks:

Method Blanks:

Methylene chloride and acetone were detected at 2 ug/L and 5 ug/L, respectively, in water method blank VBLK2. Since the only associated sample was a trip blank, no action was necessary.

Trip Blanks:

Methylene chloride was detected at 9 ug/L in trip blank 102TB03702. All positive detections of this compound in associated samples 102SB03401, 102SB03402, 102SB03501, 102SB03502, 102SB03601, 102SB03601RE, 102SB03602, 102SB03602RE, 102SB03701, 102SB03701RE, 102SB03702 and 102SB03702RE, less than 10X the blank amount, were flagged as undetected (U), with the quantitation

limit being raised to the level of contamination in each sample.

Acetone and methylene chloride were detected at 5 ug/L and 4 ug/L, respectively, in trip blank 561TB00602. All positive results for methylene in associated samples 102SB04101, 102SB04102, 102SB04601, 102SB04602, 561SB00601, 561SB00602, 596SB01301, 596SB01301RE and 596SB01302 less than 10X the blank amount were flagged as undetected (U) with the quantitation limit being raised to the CRQL or level of contamination in each sample. The positive detection of acetone in samples 561SB00601, which was less than 10X the blank amount, was flagged as undetected (U) with the detection limit being raised to the amount of contamination in the sample. No further action was taken.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of bromofluorobenzene and toluene-d8 were outside their respective 74-121% and 81-117% QC limits for the following samples:

<u>Client Sample #</u>	<u>Surrogate</u>	<u>%R</u>
102SB03501	bromofluorobenzene	61
102SB03601	bromofluorobenzene	55
102SB03602	bromofluorobenzene	69
102SB03701	bromofluorobenzene	55
102SB03702	bromofluorobenzene	57
	toluene-d8	133
102SB03701RE	bromofluorobenzene	70
102SB03702RE	bromofluorobenzene	48
	toluene-d8	157

All positive and non-detect results for these samples were flagged as estimated (J) and (UJ).

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Several %R's were slightly outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) were below their respective QC limits in spiked samples 102SB03501MS and 102SB03501MSD for the following compounds:

<u>Compound</u>	<u>MS, %R</u>	<u>MSD, %R</u>	<u>QC Limits</u>
1,1-dichloroethene	51	51	59-172%
trichloroethene	51	51	62-137%
benzene	64	-	66-142%
chlorobenzene	53	53	60-133%

The non-detect results for these compounds in unspiked sample 102SB03501 were previously flagged due to low surrogate recoveries. No further action was required.

VIII.) Field Duplicates:

Sample 561SB00601 was analyzed in this SDG, while corresponding duplicate sample 561CB00601 was analyzed in SDG 25846A. Since there were no calculable Relative Percent Differences (%RPD's) for the duplicate pair, no action was necessary.

IX.) Internal Standards Performance (ISTD):

The ISTD Percent Recoveries (%R's) were outside the 50-200% QC limits for the following samples:

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
102SB03501	chlorobenzene-d5	39.6
102SB03601	1,4-difluorobenzene	42.2
	chlorobenzene-d5	31.8
102SB03602	1,4-difluorobenzene	46.7
	chlorobenzene-d5	39.5
102SB03701	1,4-difluorobenzene	43.3
	chlorobenzene-d5	30.4
102SB03702	bromochloromethane	17
	1,4-difluorobenzene	11
	chlorobenzene-d5	6.3
596SB01301	bromochloromethane	49.0
	1,4-difluorobenzene	49.1
	chlorobenzene-d5	44.8
102SB03601RE	bromochloromethane	15.8
	1,4-difluorobenzene	12.6
	chlorobenzene-d5	10.3
102SB03602RE	1,4-difluorobenzene	45.1
	chlorobenzene-d5	39.8
102SB03701RE	bromochloromethane	33.3
	1,4-difluorobenzene	25.5
	chlorobenzene-d5	19.4
102SB03702RE	bromochloromethane	20.9
	1,4-difluorobenzene	13.6
	chlorobenzene-d5	5.4
596SB01301RE	bromochloromethane	43.2
	1,4-difluorobenzene	40.0
	chlorobenzene-d5	34.8

All non-detect results for the compounds quantitated on the ISTD's with %R's less than 25% were rejected (R), and positive results were flagged as estimated (J). All positive and non-detect results for the compounds quantitated on the other ISTD's were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses for samples 102SB03601, 102SB03701, 102SB03702 and 596SB01301 were considered by the validator to be of preferable data quality to the reanalyses due to better internal standard performances and holding times. The reanalysis of sample 102SB03602 was considered by the validator to be of preferable data quality to the original analysis due to improved surrogate performance.

All results for samples 102SB03601RE, 102SB03702 and 102SB03702RE and ten compound results for sample 102SB03701RE were rejected due to very low (less than 25%) internal standard recoveries. Results for 2-chloroethyl vinyl ether in 15 other samples were rejected due to very low RRF's. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

The Percent Difference (%D) for benzo(g,h,i)perylene was 28.6%, which exceeded the 25% QC limit for the standard analyzed on 6/26/96 at 07:53 on instrument P. The positive and non-detect results for this compound in associated samples 102SB04601, 102SB04602, 102SB03402, 102SB03502, 102SB03602, 102SB03702, 596SB01302 and 561SB00601 were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/27/96 at 09:26 on instrument P for n-nitroso-di-n-propylamine (33.1%). The results for this compound in associated samples 596SB01301 and 561SB00602, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/01/96 at 06:17 on instrument P for benzo(k)fluoroanthene (31.2%) and benzo(g,h,i)perylene (41.9%). All positive and non-detect results for these compounds in associated samples 102SB03402RE, 102SB03502RE, 102SB03602RE and 102SB03702RE were flagged as estimated (J) and (UJ).

#### IV.) Blanks:

##### Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 44.0 ug/L in method blank SBLK1. All associated positive sample results for this compound less than 10X the blank amount were flagged as undetected (U) with the analytical results less than the CRQL being raised to the CRQL. The associated samples were 102SB04601, 102SB04602, 102SB03402, 102SB03502, 102SB03602, 102SB03702, 596SB01302 and 561SB00601.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

#### VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

#### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) for acenaphthene (23%) exceeded the 19% QC limit for spiked samples 561SB00601MS and 561SB00601MSD. The non-detect result for this compound in associated unspiked sample 561SB00601 was flagged as estimated (UJ).

The Percent Recovery (%R) of pyrene (143%) exceeded the 35-142% QC limits for spiked sample 561SB00601MSD. The positive result for this compound in associated unspiked sample 561SB00601 was flagged as estimated (J).

#### VIII.) Field Duplicates:

Sample 561SB00601 was analyzed in this SDG, while corresponding sample 561CB00601 was analyzed in SDG 25846A. There were no calculable RPD's for this duplicate sample pair. No action was taken.

#### IX.) Internal Standards Performance (ISTD's):

The internal standard area counts for the following compounds were below the 50-200% QC limits for the following samples:

<u>Client Sample #</u>	<u>Internal Standard</u>	<u>%R</u>
561SB00601	chrysene-d12	48.4
	perylene-d12	23.1
102SB03402	chrysene-d12	34.9
	perylene-d12	14.8
102SB03502	chrysene-d12	33.6
	perylene-d12	15.5
102SB03602	chrysene-d12	40.3
	perylene-d12	18.2
102SB03702	chrysene-d12	35.3
	perylene-d12	15.7
102SB03402RE	phenanthrene-d10	48.2
	chrysene-d12	23.2
	perylene-d12	15.6
102SB03502RE	phenanthrene-d10	47.7
	chrysene-d12	27.4
	perylene-d12	18.4
102SB03602RE	phenanthrene-d10	43.3
	chrysene-d12	28.5
	perylene-d12	19.9
102SB03702RE	acenaphthene-d10	42.4
	phenanthrene-d10	35.2
	chrysene-d12	22.8
	perylene-d12	14.5

All non-detect results for the compounds quantitated on ISTD's with %R's less than 25% were rejected (R), and the positive results were flagged as estimated (J). All positive and non-detect results for the compounds quantitated on the other ISTD's were flagged as estimated (J) and (UJ).

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 102SB03402, 102SB03502, 102SB03602 and 102SB03702

were considered by the validator to be of preferable data quality to the reanalyses because of better Internal Standards Performances.

All non-detect results for the compounds quantitated on ISTD perylene-d12 were rejected (R) in samples 102SB03402, 102SB03502, 102SB03602, 102SB03702, 561SB00601, 102SB03402RE, 102SB03502RE, 102SB03602RE and 102SB03702RE. The non-detect results for compounds quantitated on ISTD chrysene-d12 in samples 102SB03402RE and 102SB03402RE were also rejected. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/27/96 at 19:04 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
gamma-BHC	27.8%	-
heptachlor	42.0%	-
endosulfan I	48.0%	30.5%
dieldrin	42.5%	-
endrin	46.9%	25.3%
4,4'-DDT	79.8%	73.9%
methoxychlor	69.9%	56.6%

The positive and non-detect results for these compounds in associated samples 102SB03402, 102SB03502, 102SB03602, 102SB03702, 102SB04601, 596SB01301, 596SB01302, 561SB00601 and 561SB00602 were flagged as estimated (J) and (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/27/96 at 19:34 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
beta-BHC	29.0%	-
delta-BHC	33.1%	-
aldrin	35.9%	-
heptachlor epoxide	44.2%	-
4,4-DDE	35.9%	-
endosulfan sulfate	40.9%	-
endrin ketone	46.4%	27.4%
endrin aldehyde	44.9%	33.8%
alpha chlordane	44.4%	25.9%
gamma chlordane	41.1%	25.8%

The positive and non-detect results for these compounds in associated samples 102SB03402, 102SB03502, 102SB03602, 102SB03702, 102SB04601, 596SB01301, 596SB01302, 561SB00601 and 561SB00602 were flagged as estimated (J) and (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of decachlorobiphenyl (DCB) were outside the 30-150% QC limits for the following sample:

<u>Client Sample #</u>	<u>Column 1</u>	<u>Column 2</u>
561SB00601	4.0%	6.0%

All positive results for this sample were flagged as estimated (J) and all non-detects were rejected (R) since the surrogate recovery was less than 10%.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analysis were not performed for this SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

The Percent Differences (%D's) between columns 1 and 2 exceeded the 70% QC limit for the following compounds and associated samples:

<u>Sample</u>	<u>Compound</u>	<u>%D</u>
102SB03602	dieldrin	111
	endrin	137
102SB03702	4,4'-DDT	72.7

The results for these compounds in the associated samples were flagged as estimated (J).

IX.) Field Duplicates:

Sample 561SB00601 was analyzed in this SDG, while corresponding sample 561CB00601 was analyzed in SDG 25846A. There were no calculable Relative Percent Differences (RPD's) for this field duplicate pair, so no action was required.

X.) Pesticide Cleanup Check:

Florisol Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All non-detect results in sample 561SB00601 were rejected because of surrogate %R's of less than 10%. All other laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB2	iron	20.4 ug/L	20.4 mg/kg
CCB2	lead	18.0 ug/L	18.0 mg/kg
CCB3	silver	2.30 ug/L	2.30 mg/kg

CCB = Continuing Calibration Blank

All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration blank were flagged as undetected (U).

IV.) ICP Interference Check Sample Results:

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

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

antimony	8 ug/L
chromium	2 ug/L
thallium	8 ug/L

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

Negative results were observed for barium (-2 ug/L), manganese (-4 ug/L), selenium (-7 ug/L), vanadium (-3 ug/L) and zinc (-6 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed for this SDG. No action was necessary.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed for this SDG. No action was necessary.

VIII.) Matrix Spike Analysis (MS):

MS analysis was not performed for this SDG. No action was taken.

IX.) Field Duplicates:

Sample 561SB00601 was analyzed in this SDG, while field duplicate sample 561CB00601 was analyzed in SDG 25846A. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>561SB00601, mg/kg</u>	<u>561CB00601, mg/kg</u>	<u>RPD</u>
aluminum	4870	7450	41.9
arsenic	3.9	6.9	55.6
barium	33.7	45.4	29.5
calcium	2270	7090	103
chromium	6.8	11	47.2
copper	30.5	19.9	42.1
iron	7170	12100	51.2
lead	95.4	126	27.6
manganese	45.8	80.5	54.9
mercury	0.1	0.2	66.7
vanadium	11.5	19.5	51.6
zinc	48.7	65.7	29.7

The results for the calcium and mercury in these two samples were flagged as estimated (J) because their RPD's exceeded the 60% QC limit for soil samples. All other RPD criteria were met. No further action was taken.

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:

All laboratory data were acceptable with qualifications.

# 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: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0069  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRICES: Soil, Water  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NO: 25885A (Level IV)

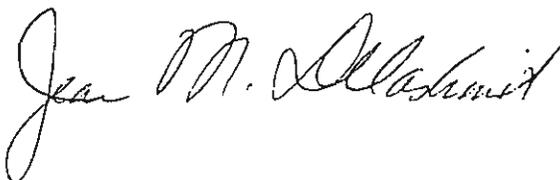
### SAMPLES:

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
053CB00301	25886.01	Soil	X
053CB00401	25886.02	Soil	X
053EB00401	25916.02	Water	X
053DB00401	25916.01	Water	X

C = FIELD DUPLICATE (Soil), E = EQUIPMENT RINSATE BLANK, D = DEIONIZED WATER BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 25885A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 053CB00301, 053CB00401, 053EB00401, 053DB00401

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was required.

Calibration Verifications:

All criteria were met, so no action was required.

IV.) Blanks

Method Blanks:

The following 2,3,7,8-substituted PCDD's and PCDF's were detected in the method blanks at the concentration listed:

<u>Method</u> <u>Blank ID</u>	<u>Compound</u>	<u>Conc.</u> <u>ng/Kg</u>	<u>Action Level</u> <u>ng/Kg</u>
DFBLK3	OCDD	1.5	7.5

Detections of OCDD in the associated sample were greater than 5X the blank amount, so no action was required.

Field Blanks:

Deionized water blank 053DB00401 and equipment rinsate blank 053EB00401 were analyzed. Several 2,3,7,8-substituted PCDD's and PCDF's were detected in the equipment rinsate blank at the following concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>ng/kg</u>
053EB00401	OCDD	10.4	5.2
	1234678-HpCDF	10.3	5.2
	OCDF	7.7	3.9

All detections of these compounds in the associated samples below 5X the blank amounts were designated as EMPC (Estimated Maximum Possible Concentration).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD were analyzed in this SDG. No action was taken.

Two LCS samples were analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

The samples corresponding to field duplicate samples 053CB00301 and 053CB00401 were not analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Upon validation, laboratory "X" flags (meaning "EMPC") were removed from all method blanks and were replaced with "EMPC" for all samples results.

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0069  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRICES: Soil and Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides / PCB's, Chlorinated Herbicides, Organophosphorus Pesticides, Total Metals and Cyanide, Organotin, Hexavalent Chromium  
SDG NUMBERS: 25885A (Appendix IX, Level IV)  
25885B (Level III)

### SAMPLES:

#### SDG 25885A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Chlorinated Herbicides
053CB00301*	25866.01	Soil	X	X	+	X
053CB00301RE	25866.01RE	Soil			X	
053CB00401*	25866.02	Soil	X	X	+	X
053CB00401RE	25866.02RE	Soil			X	
053DB00401	25916.01	Water	X	X	X	X
053EB00401	25916.02	Water	X	X	X	+
053EB00401RE	25916.02RE	Water				X

Client Sample #	Lab Sample #	Matrix	Organophos. Pesticides	Organotin	Metals/ Cyanide	Hexavalent Chromium
053CB00301*	25866.01	Soil	X	X	X	X
053CB00301DL	25866.01DL	Soil		+		
053CB00401*	25866.02	Soil	X		X	X
053DB00401	25916.01	Water	X		X	X
053EB00401	25916.02	Water	X		X	X

\* = Field duplicates were associated with samples 053SB00301 and 053SB00401 in SDG 25885B.  
 + = Non-billable Analysis

CB = FIELD DUPLICATE, DB = DEIONIZED WATER BLANK, DL = DILUTION, EB = EQUIPMENT RINSATE BLANK, RE = REANALYSIS

SDG 25885B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- Volatiles	Pesticides/ PCB's
053SB00301*	25885.01	Soil	X	X	X
053SB00302	25885.04	Soil	X	X	X
053SB00401*	25885.05	Soil	X	X	X
053SB00401RE	25885.05RE	Soil	+		
053SB00402	25885.06	Soil	X	X	X
053TB00401	25916.03	Water	X		
053TB00402	25885.07	Water	X		

Client Sample #	Lab Sample #	Matrix	Organotin	Metals/ Cyanide
053SB00301*	25885.01	Soil	X	X
053SB00301DL	25885.01DL	Soil	+	
053SB00302	25885.04	Soil	X	X
053SB00302DL	25885.04DL	Soil	+	
053SB00401*	25885.05	Soil	X	X
053SB00401DL	25885.05DL	Soil	+	
053SB00402	25885.06	Soil	X	X
053SB00402DL	25885.06DL	Soil	+	
053SB00301MS	25885.01MS	Soil	+	
053SB00301MSDDL	25885.01MSDL	Soil	+	
053SB00301MSD	25885.01MSD	Soil	+	
053SB00301MSDDL	25885.01MSDDL	Soil	+	

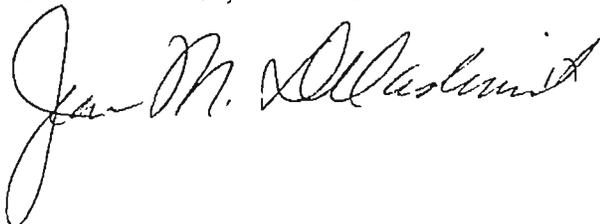
+ = Non-billable Analysis

\* = Samples were associated with field duplicates samples 053CB00301 and 053CB00401 in SDG 25885A.

DL = DILUTION, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, TB = TRIP BLANK

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

RELEASE SIGNATURE:



### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 25885A Appendix IX, CLP Organics and Inorganics

SAMPLES: 053CB00301, 053CB00301RE, 053CB00301DL 053CB00401, 053CB00401RE,  
053DB00401, 053EB00401, 053EB00401RE

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met. No action was required.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factors (RRF's) for acrolein (0.034), acetonitrile (0.026), isobutyl alcohol (0.007) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards analyzed on 2/1/96 on instrument C. The results for these compounds in associated samples 053CB00301 and 053CB00401, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/1/96 on instrument C for the following compounds:

chloromethane	31.2%
chloroethane	33.0%
acrylonitrile	31.2%
isobutyl alcohol	48.6%
acetone	53.1%
2-hexanone	40.5%
chloroprene	30.7%
propionitrile	30.9%
methacrylonitrile	30.6%
1,4-dioxane	35.2%
1,1,1,2-tetrachloroethane	32.1%
dibromomethane	32.3%

The non-detect results for isobutyl alcohol and 1,4-dioxane were previously rejected because of low RRF's in this calibration. Since the other compounds were not detected in the associated samples, no further action was necessary.

The average Relative Response Factors (RRF's) for isobutyl alcohol (0.017) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards analyzed on 6/5/96 on instrument U. The results for these compounds in associated blanks 053DB00401 and 053EB00401, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/1/96 on instrument C for the following compounds:

bromomethane	47.0%
acetone	39.0%
2-butanone	32.4%
1,4-dioxane	70.5%
dichlorodifluoromethane	51.4%

The non-detect result for 1,4-dioxane were previously rejected because of a low RRF in this calibration. Since the two associated samples were field blanks, no further action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) for 1,4-dioxane (0.002), dichlorodifluoromethane (0.040) and isobutyl alcohol (0.019) were below the 0.050 QC limit for the standards analyzed on 6/11/96 at 17:32 on instrument U. The non-detect results isobutyl alcohol and 1,4-dioxane were previously rejected based on low RRF's in the initial calibration. The non-detect results for dichlorodifluoromethane in associated blanks 053DB00401 and 053EB00401 were rejected (R). No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/11/96 at 17:32 on instrument U for the following compounds:

2-chloroethyl vinyl ether	26.6%
dichlorodifluoromethane	52.9%
vinyl acetate	56.8%

The non-detect results dichlorodifluoromethane in associated blanks 053DB00401 and 053EB00401 were previously rejected because of low a RRF in this calibration. Since the two associated samples were field blanks, no further action was necessary.

The Relative Response Factors (RRF's) for 1,4-dioxane (0.002), acetonitrile (0.029) and isobutyl alcohol (0.009) were below the 0.050 QC limit for the standards analyzed on 6/12/96 at 14:52 on instrument C. The non-detect results for these compounds in associated samples 053CB00301 and 053CB00401 were previously rejected based on the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/12/96 at 14:52 on instrument C for the following compounds:

2-chloroethyl vinyl ether	42.3%
dichlorodifluoromethane	48.4%
vinyl acetate	55.1%
bromomethane	26.0%

chloroethane	26.4%
1,1,1-trichloroethane	30.3%
carbon tetrachloride	27.2%
dibromochloromethane	27.8%
bromoform	25.7%
tetrachloroethene	26.9%
acrolein	50.0%
isobutyl alcohol	28.6%
trichlorofluoromethane	76.1%

The non-detect results for acrolein and isobutyl alcohol in associated samples 053CB00301 and 053CB00401 were previously rejected because of low RRF's in the initial calibration. All results for the other compounds in the two samples, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water Blank:

Chloroform (39 ug/L) and bromodichloromethane (4 ug/L) were detected in deionized water blank 053DB00401. These compounds were not detected in the associated samples. No action was taken.

Equipment Rinsate Blank:

Chloroform (40 ug/L) and bromodichloromethane (4 ug/L) were detected in equipment rinsate blank 053EB00401. These compounds were not detected in the associated samples. No action was taken.

Trip Blank:

Methylene chloride and trichloroethene were detected at 4 ug/L and 23 ug/L, respectively, in trip blank 053TB00403, which was analyzed in SDG 25855B. The positive detections of methylene chloride in associated samples 053CB00301 and 053CB00401, which were less than 10X the blank amount, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample. Trichloroethene was not detected in the associated samples. No further action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Several %R's were outside the QC limits. Data validation action based on LCS recoveries was not required, so no action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG fraction. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples 053CB00301 and 053CB00401 were analyzed in this SDG while corresponding samples 053SB00301 and 053CB00401 were analyzed in SDG 25885B. There were no calculable RPD's for the two field duplicate sample pairs. No action was taken.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for acetonitrile, isobutyl alcohol, 1,4-dioxane and acrolein in samples 053CB00301 and 053CB00401 were rejected due to low Relative Response Factors in the initial and continuing calibrations. The non-detect results for isobutyl alcohol, 1,4-dioxane and dichlorodifluoromethane were rejected in field blanks 053DB00401 and 053EB00401 because of low RRF's in the initial and continuing calibration. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

### III.) Calibration:

#### Initial Calibration:

The average Relative Response Factors (RRF's) for aramite (0.030) and hexachlorophene (0.048) were below the 0.050 QC limit for the standards analyzed on 6/25/96 on instrument A. The results for these compounds in all SDG samples and blanks, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 6/25/96 on instrument A for the following compounds:

m-cresol	35.1%
1,2,4,5-tetrachlorobenzene	32.0%
1,4-napthaquinone	33.6%
1,3-dinitrobenzene	34.7%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.6%
2-naphthylamine	33.8%
diphenylamine	31.6%
sulfotepp	35.8%
pronamide	34.0%
pentachloronitrobenzene	47.1%
methyl parathion	36.1%
parathion	39.1%
methapyrilene	41.3%
isodrin	34.9%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
7,12-dimethylbenz(a)anthracene	48.0%
a,a-dimethylphenethylamine	41.2%
safrole	33.6%
1,3,5-trinitrobenzene	31.9%
2-sec-butyl-4,5-dinitrophenol	34.4%
p-phenylenediamine	38.1%
pentachlorobenzene	38.9%
butylbenzylphthalate	34.0%
bis(2-ethylhexyl)phthalate	31.9%
2-nitroaniline	32.8%

These compounds were not detected in the four associated samples. No action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.042) and hexachlorophene (0.027) were below the 0.050 QC limit for the standards analyzed on 6/24/96 at 19:07 on instrument A. The non-detect results for these two compounds in the associated samples were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/24/96 at 19:07 on instrument A for the following compounds:

2,6-dichlorophenol	47.0%
hexachloropropene	48.6%
1,2,4,5-tetrachlorobenzene	53.8%
2,4-dinitrophenol	28.9%
pentachlorobenzene	62.6%
methapyrilene	30.0%
aramite	40.0%
methyl methanesulfonate	49.9%
ethyl methanesulfonate	27.0%
acetophenone	49.9%
n-nitrosomorpholine	90.2%
o-toluidine	40.8%
o,o,o-tricethyl phosphorothionate	31.5%
1-nitroso-piperidine	29.0%
n-nitroso-di-n-butylamine	52.1%
safrole	69.3%
isosafrole	72.1%
1,3-dinitrobenzene	72.3%
1,4-napthaquinone	60.3%
1-naphthylamine	46.9%
2-naphthylamine	49.9%
thionazin	36.0%
phorate	28.8%
phenacetin	51.7%
dimethoate	37.3%
4-aminobiphenyl	47.1%
pronamide	45.2%
pentachloronitrobenzene	47.1%
methyl parathion	56.8%
parathion	78.6%
isodrin	42.3%
chlorobenzilate	29.2%
3,3'-dimethylbenzidine	43.4%
famphur	66.1%
2-acetamidofluorene	80.3%

The non-detect results for aramite in the associated sample was previously rejected because of low RRF's the initial calibration and in this calibration. The results for the other compounds in associated sample 053CB00401, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factors (RRF's) for aramite (0.037) and hexachlorophene (0.026) were below the 0.050 QC limit for the standards analyzed on 6/25/96 at 15:58 on instrument A. The non-detect results for these two compounds in the associated sample were previously rejected based on the initial calibration. No further action was required.

The Relative Response Factors (RRF's) for aramite (0.030) and hexachlorophene (0.014) were below the 0.050 QC limit for the standards analyzed on 6/26/96 at 12:11 on instrument A. The non-detect results for these two compounds in associated sample 053CB00301 were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 6/26/96 at 12:11 on instrument A for the following compounds:

n-nitrosodimethylamine	33.0%
methyl methanesulfonate	47.1%
acetophenone	41.1%
n-nitroso-di-n-butylamine	54.8%
n-nitroso-di-n-propylamine	29.3%
n-nitrosopyrrolidine	34.3%
saffrole	71.6%
isosaffrole	54.8%
1,4-napthaquinone	59.6%
n-nitrosodi-n-butylamine	54.8%
thionazin	42.8%
phorate	36.1%
phenacetin	51.7%
dimethoate	43.8%
pronamide	63.5%
pentachloronitrobenzene	60.1%
disulfoton	43.0%
chlorobenzilate	27.3%
methapyrilene	47.0%
3,3'-dimethylbenzidine	32.0%
3,3'-dichlorobenzidine	38.0%
m-cresol	66.3%
diphenylamine	51.5%
sulfotep	28.5%
kepone	134%
7,12-dimethylbenz(a)anthracene	67.2%
p-phenylenediamine	33.1%
1,3,5-trinitrobenzene	49.4%
hexachlorophene	71.9%

The non-detect result for hexachlorophene in the associated sample was previously rejected because of low RRF's the initial calibration and in this calibration. The results for the other compounds in associated sample 053CB00301, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks associated with this SDG. No action was required.

Deionized Water Blank:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in deionized water blank 053DB00401. Since this compound was not detected in the associated samples, no action was taken.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG fraction. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples 053CB00301 and 053CB00401 were analyzed in this SDG while corresponding samples 053SB00301 and 053SB00401 were analyzed in SDG 25885B. There were no calculable RPD's for the two field duplicate sample pairs. No action was taken.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene in all samples were rejected due to low Relative Response Factors in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*PESTICIDES / PCB'S*

I.) Holding Times:

The holding time from sampling date to reextraction was 26 days for samples 053CB00301RE and 053CB00401RE, which exceeded the 14 day QC limit. All positive and non-detect results in the two samples were flagged as estimated (J) and (UJ).

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized and Equipment Rinsate Blanks:

There were no positive detections in the field blanks in this SDG. No action was taken.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of the surrogates were outside the 30-150% QC limits for the following samples:

Client Sample #	TCX, %R Column 1	TCX, %R Column 2	DCB, %R Column 1	DCB, %R Column 2
053CB00301	0	0	0	18
053CB00401	0	0	0	0

All positive results for the two samples were flagged as estimated (J) and all non-detects were rejected (R). All Surrogate Recovery criteria were met for the reextraction of the two samples. No further action was taken.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses associated with this SDG. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples 053CB00301 and 053CB00401 were analyzed in this SDG while corresponding samples 053SB00301 and 053SB00401 were analyzed in SDG 25885B. There were no calculable RPD's for the two field duplicate sample pairs. No action was taken.

IX.) TCL Compound Identification (PIS):

The PIS Percent Difference (%D) for 4,4'-DDE was 310% in sample 053CB00301RE, which exceeded the 70% QC limit. Since the %D exceeded 300%, the compound was flagged as undetected (U) with the analytical result being rounded up to the next significant figure.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All non-detect results were rejected in the original analyses of samples 053CB00301 and 053CB00401 because of very low surrogate recoveries (0%). The reextraction analyses of the two samples were considered to be of preferable data quality because of improved surrogate recoveries. These reanalyses were, therefore, selected for validation. All other laboratory data were acceptable with qualifications.

*CHLORINATED HERBICIDES*

I.) Holding Times:

The holding time from sampling date to extraction was 21 days for samples 053CB00301 and 053CB00401, which exceeded the 14 day QC limit. All results for the two samples, which consisted

entirely of non-detects, were flagged as estimated (UJ).

II.) Instrument Performance:

All Herbicide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized and Equipment Rinsate Blanks:

There were no positive detections in the field blanks in this SDG. No action was taken.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) of 2,4-dichlorophenylacetic acid (DCAA) was 3% in equipment rinsate blank 053EB00401, which was below the 10% rejection limit. All results for this blank, which consisted entirely of non-detects, were rejected (R). The %R of DCAA in the reanalyses of this equipment rinsate blank was 162%, which was greater than the 150% QC limit. All results for this blank were non-detects, so no action was required.

VI.) Laboratory Control Samples (LCS):

Five LCS's were analyzed with this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All results for sample 053EB00401 were rejected because of a low (less than 10%) surrogate recovery. The reanalyses of this blank was selected for validation because no data points were rejected. All other laboratory data were acceptable with qualifications.

*ORGANOPHOSPHORUS PESTICIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized and Equipment Rinsate Blanks:

There were no positive detections in the field blanks in this SDG. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. Two %R's were below the QC limit. Data validation

action based on LCS criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses associated with this fraction. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction. No action was taken.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factor (RRF) for tetrabutyltin (TTBT) was 0.038, which was below the 0.050 QC limit for the standards analyzed on 6/19/96. The non-detect result for this compound in associated sample 053CB00301 was rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) of tetrabutyltin (TTBT) was 0.045, which was below the 0.050 QC limit for the standards analyzed on 6/21/96. All results for this compound in the associated sample were previously rejected based on the initial calibration. No further action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

No MS / MSD analyses were analyzed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable RPD's for field duplicate samples 053CB00301 and 053SB00301 (analyzed in SDG 25885B). No action was required.

IX.) Internal Standards Performance (ISTD):

The concentration of internal standard phenanthrene-d10 added to sample 053CB00301 was 10X the amount required for low level organotins. Since the %R's for this sample and for the 1:10 dilution verification sample both were within the 50-200% QC limits, no action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The non-detect result for TTBT in sample 053CB00301 was rejected because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

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

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
EB	aluminum	65.8 ug/L	65.8 mg/kg
CCB1	antimony	5.40 ug/L	5.40 mg/kg
EB	arsenic	2.60 ug/L	2.60 mg/kg
DB	barium	105 ug/L	105 mg/kg
DB	beryllium	0.32 ug/L	0.32 mg/kg
DB	calcium	974 ug/L	974 mg/kg
PBS	chromium	0.16 mg/kg	0.80 mg/kg
EB	copper	0.60 ug/L	0.60 mg/kg
DB	magnesium	118 ug/L	118 mg/kg
EB	manganese	4.40 ug/L	4.40 mg/kg
DB	potassium	1820 ug/L	1820 mg/kg
EB	sodium	23500 ug/L	23500 mg/kg
PBS	tin	1.93 mg/kg	9.96 mg/kg
DB	cyanide	2.00 ug/L	2.00 mg/kg

CCB = Continuing Calibration Blank, DB = Deionized Water Blank (053DB00401),  
EB = Equipment Rinsate Blank (053EB00401), PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soil samples) for which the contaminated blank was an associated calibration, deionized water or preparation blank were flagged as undetected (U).

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

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB1	cyanide	-2.00 ug/L	2.00 mg/kg
CCB3	selenium	-3.20 ug/L	3.20 mg/kg

CCB = Continuing Calibration Blank

The associated sample results, which consisted entirely of non-detects after blank qualifications, were flagged as estimated (UJ).

IV.) ICP Interference Check Sample Results:

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

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

barium	2 ug/L
antimony	11 ug/L
chromium	3 ug/L
nickel	2 ug/L
silver	3 ug/L
thallium	10 ug/L

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

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

barium	- 2 ug/L
lead	-2 ug/L
manganese	-4 ug/L
selenium	-17 ug/L
vanadium	-3 ug/L

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

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There were no Duplicate Sample Analyses in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spikes analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Samples 053CB00301 and 053CB00401 were analyzed in this SDG, while corresponding samples 053SB00301 and 053SB00401 were analyzed in SDG 25885B. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>053CB00301, mg/kg</u>	<u>053SB00301, mg/kg</u>	<u>RPD</u>
aluminum	3810	3210	17.1
arsenic	4.1	3.5	15.8
calcium	2530	2380	6.1
chromium	167	193	14.4
cobalt	3.3	5.7	53.3
copper	7.5	4.4	60.8
iron	2460	2420	1.6
lead	11.8	8.6	31.4
magnesium	4350	3990	8.6
manganese	28.1	28.2	0.4
mercury	0.69	0.70	1.4
nickel	6.1	5.3	14.0
zinc	45.6	22.4	60.7

<u>Analyte</u>	<u>053CB00401, mg/kg</u>	<u>053SB00401, mg/kg</u>	<u>RPD</u>
aluminum	3270	3240	0.9
calcium	4150	4340	4.5
chromium	14.5	14.5	0
copper	19.3	25.2	26.5
iron	2860	3370	16.4
lead	18.4	16.9	8.5
nickel	4.6	4.4	4.4
manganese	35.0	36.0	2.8
mercury	0.23	0.28	19.6
zinc	61.0	60.6	0.7

The RPD's for copper and zinc in the first set of field duplicates exceeded the 60% QC limit for soil samples. The positive results for these two analytes in samples 053CB00301 and 053SB00301 were flagged as estimated (J). All criteria were met for the second set of field duplicates. No further action was taken.

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. 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:

All laboratory data were acceptable with qualifications.

*HEXAVALENT CHROMIUM*

I.) Holding Times:

The holding times from sampling date to analyses were 14 days for samples 053CB00301 and 053CB00401, which exceeded the 1 day QC limit. Since the exceedances were many times the QC limit, the non-detect results for hexavalent chromium in these samples were rejected (R).

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blank:

Hexavalent chromium was not detected in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

Hexavalent chromium was detected at 0.025 mg/L in both field blanks. Since the two associated sample results were previously rejected due to excessive holding times, no further action was taken.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VI.) Field Duplicates:

No field duplicate samples were analyzed in this fraction. No action was taken.

VII.) Overall Assessment of Data/General:

The non-detect results for hexavalent chromium were rejected in samples 053CB00301 and 053CB00401 because of holding time exceedances.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 25885B Level III, CLP Organics and Inorganics

SAMPLES: 053SB00301, 053SB00301DL, 053SB00302, 053SB00302DL, 053SB00401,  
053SB00401RE, 053SB00401DL, 053SB00402, 053SB00402DL, 053SB00301MS,  
053SB00301MSDL, 053SB00301MSD, 053SB00301MSDDL

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The Average Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.046) was below the 0.050 QC limit for the standard analyzed on 4/29/96 on instrument R. The non-detect result for this compound in associated trip blank 053TB00402 was rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/1/96 on instrument C for the following compounds:

chloromethane	31.2%
chloroethane	33.0%
acetone	53.1%
2-hexanone	40.5%

These compounds were not detected in the associated samples, so no action was necessary.

##### Continuing Calibration:

The Relative Response Factor (RRF) of 2-chloroethyl vinyl ether (0.039) was below the 0.050 QC limit for the standard analyzed on 6/11/96 at 09:51 on instrument C. The non-detect results for this compound in associated samples 053SB00301, 053SB00302 and 053SB00401 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/11/96 at

09:51 on instrument C for the following compounds:

acetone	32.8%
vinyl acetate	48.8%
2-chloroethyl vinyl ether	64.2%

All results for 2-chloroethyl vinyl ether were previously rejected because of a low RRF in this calibration. The results for the other two compounds in associated samples 053SB00301, 053SB00302 and 053SB00401, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/12/96 at 14:52 on instrument C for the following compounds:

bromomethane	26.0%
chloroethane	26.4%
1,1,1-trichloroethane	30.3%
carbon tetrachloride	27.2%
vinyl acetate	55.1%
dibromochloromethane	27.8%
bromoform	25.7%
tetrachloroethene	26.9%
2-chloroethyl vinyl ether	42.3%

All results for these compounds in associated sample 053SB00402, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

Methylene chloride and acetone were detected at 2.0 ug/L and 5 ug/L, respectively, in method blank VBLK1. Since the associated samples were trip blanks, no action was required.

##### Deionized Water and Equipment Rinsate Blanks:

Chloroform (40 ug/L) and bromodichloromethane (4 ug/L) were detected in both deionized water blank 053DB00401 and equipment rinsate blank 053EB00401, which were analyzed in SDG 25885A. Since these compounds were not detected in the associated samples, no action was necessary.

##### Trip Blanks:

Methylene chloride and trichloroethene were detected at 4 ug/L and 23 ug/L, respectively, in trip blank 053TB00402. Detections of methylene chloride in associated samples 053SB00301, 053SB00302, 053SB00401 and 053SB00402 less than 10X the blank amount were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample. Detections of trichloroethene in associated samples 053SB00301 and 053SB00302 less than 5X the blank amount were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Eight LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not analyzed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

Samples 053SB00301 and 053SB00401 were analyzed in this SDG while corresponding field duplicate samples 053CB00301 and 053CB00401 were analyzed in SDG 25885A. There were no calculable RPD's for the two field duplicate sample pairs. No action was taken.

IX.) Internal Standards Performance (ISTD):

The Percent Recovery (%R) of chlorobenzene-d5 (49%) in sample 053SB00401 was below the 50-200% QC limits. Compounds quantitated on this ISTD, which consisted entirely of non-detects, were flagged as estimated (UJ). All ISTD's in the reanalysis were below the QC limits. No further action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The original analysis of sample 053SB00401 was considered by the validator to be of preferable data quality to the reanalysis because of better ISTD recoveries. The original analysis was, therefore, selected for validation. The non-detect results for 2-chloroethyl vinyl ether in the samples 053SB00301, 053SB00302 and 053SB00401 were rejected (R) due to a low RRF in the continuing calibration. All other laboratory data were acceptable without qualifications.

## *SEMIVOLATILE ORGANICS*

### I.) Holding Times:

All Holding Time criteria were met. No action was required.

### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

### III.) Calibration:

#### Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

#### Continuing Calibration:

The Percent Differences (%D's) were 29.1% and 25.8%, respectively, for 2,2'-oxybis(1-chloropropane) and 3,3'-dichlorobenzidine, which exceeded the 25% QC limit for the standards analyzed on 6/28/96 at 08:58 on instrument P. All results for these compounds in all SDG samples, which consisted entirely of non-detects, were flagged as estimated (UJ).

### IV.) Blanks:

#### Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 44 ug/kg in soil method blank SBLK1. This compound was not detected in the associated samples. No action was required.

#### Deionized Water Blank:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in deionized water blank 053DB00401. This compound was not detected in the associated samples. No action was required.

### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

### VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All criteria were met. No action was taken.

### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction. No action was required.

VIII.) Field Duplicates:

Field duplicate samples 053SB00301 and 053SB00401 were analyzed in this SDG while corresponding field duplicate samples 053CB00301 and 053CB00401 were analyzed in SDG 25885A. There were no calculable RPD's for the two field duplicate sample pairs. No action was taken.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was necessary.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*PESTICIDES / PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Instrument Performance criteria were met. No action was taken.

III.) Calibration:

Initial Calibration:

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

#### Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 6/28/96 at 00:30 on the primary column for beta-BHC (29.3%). The non-detect results for this compound in associated samples 053SB00301 and 053SB00402 were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 6/28/96 at 08:18 on the primary column for beta-BHC (39.4%) and 4,4'-DDD (25.9%) and on the secondary column for 4,4'-DDT (51.5%) and methoxychlor (30.8%). The non-detect results for these compounds in associated samples 053SB00301 and 053SB00402 were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blank:

There were no positive detections in the method blank. No action was required.

##### Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the field blanks, analyzed in SDG 25885A. No action was required.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

#### VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All criteria were met. No action was taken.

#### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was taken.

#### VIII.) Field Duplicates:

Samples 053SB00301 and 053SB00401 were analyzed in this SDG while corresponding field duplicate samples 053CB00301 and 053CB00401 were analyzed in SDG 25885A. There were no calculable RPD's for the two field duplicate sample pairs. No action was taken.

#### IX.) TCL Compound Identification (PIS):

All PIS Percent Difference criteria were met. No action was necessary.

#### X.) Pesticide Cleanup Check:

##### Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

### *ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

The Average Relative Response Factor (RRF) for tetrabutyltin (TTBT) was 0.037, which was below the 0.050 QC limit for the standards analyzed on 6/19/96. The results for this compound in associated samples 053SB00301, 053SB00302, 053SB00401 and 053SB00402, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) of tetrabutyltin was 0.045, which was below the 0.050 QC limit for the standards analyzed on 6/21/96 at 11:49. All results for this compound in the associated samples were previously rejected based on the initial calibration. No further action was required.

The Percent Difference (%D) for monobutyltin was 29.7%, which exceeded the 25% QC limit, for the standard analyzed on 6/21/96 at 11:49. The results for this compound in associated samples 053SB00301, 053SB00302, 053SB00401 and 053SB00402, which consisted entirely of non-detects, were rejected flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded their QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of dibutyltin (DBT) were 194% in both spiked samples 053SB00301MS and 053SB00301MSD. Since this compound was not detected in unspiked sample 053SB00301, no action was taken.

VIII.) Field Duplicates:

There were no calculable RPD's for field duplicate samples 053SB00301 and 053CB00301 (analyzed in SDG 25885A). No action was required.

IX.) Internal Standards Performance (ISTD):

The concentration of internal standard phenanthrene-d10 added to samples 053SB00301, 053SB00302, 053SB00401 and 053SB00402 was 10X the amount required for low level organotins. The %R's for these samples and for the 1:10 dilution verification samples were within the 50-200% QC limits, so no action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The dilution analysis results were not validated. These were analyzed because of excess ISTD concentrations, not high sample concentrations. The non-detect results for tetrabutyltin in all samples were rejected because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank ID</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
EB	aluminum	65.8 ug/L	65.8 mg/kg
CCB1	antimony	5.40 ug/L	5.40 mg/kg
EB	arsenic	2.60 ug/L	2.60 mg/kg
DB	barium	105 ug/L	105 mg/kg
DB	beryllium	0.32 ug/L	0.32 mg/kg
DB	calcium	974 ug/L	974 mg/kg
PBS	chromium	0.16 mg/kg	0.80 mg/kg
EB	copper	0.60 ug/L	0.60 mg/kg
DB	magnesium	118 ug/L	118 mg/kg
EB	manganese	4.40 ug/L	4.40 mg/kg
PBS	nickel	0.10 mg/kg	0.50 mg/kg
DB	potassium	1820 ug/L	1820 mg/kg
EB	sodium	23500 ug/L	23500 mg/kg
DB	cyanide	2.00 ug/L	2.00 mg/kg

CCB = Continuing Calibration Blank, DB = Deionized Rinsate Blank (053DB00401),  
EB = Equipment Rinsate Blank (053EB00401), PBS = Preparation Blank (Soil)

The deionized water and equipment rinsate blanks were analyzed in SDG 25885A. All results greater than the IDL but less than 5X the blank amount (Action Level for which the contaminated blank was an associated calibration, deionized water or preparation blank were flagged as undetected (U).

IV.) ICP Interference Check Sample Results:

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

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

barium	2 ug/L
antimony	11 ug/L
chromium	3 ug/L
nickel	2 ug/L
silver	3 ug/L
thallium	10 ug/L

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

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

barium	- 2 ug/L
lead	-2 ug/L
manganese	-4 ug/L
selenium	-17 ug/L
vanadium	-3 ug/L

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

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There were no Duplicate Sample Analyses in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spikes analyzed in this SDG. No action was taken.

IX.) Field Duplicates:

Samples 053SB00301 and 053SB00401 were analyzed in this SDG, while corresponding field duplicate samples 053CB00301 and 053CB00401 were analyzed in SDG 25885A. The calculable Relative Percent Differences (RPD's) were:

Analyte	053CB00301, mg/kg	053SB00301, mg/kg	RPD
aluminum	3810	3210	17.1
arsenic	4.1	3.5	15.8
calcium	2530	2380	6.1
chromium	167	193	14.4
cobalt	3.3	5.7	53.3
copper	7.5	4.4	60.8
iron	2460	2420	1.6
lead	11.8	8.6	31.4
magnesium	4350	3990	8.6
manganese	28.1	28.2	0.4
mercury	0.69	0.70	1.4
nickel	6.1	5.3	14.0
zinc	45.6	22.4	60.7

Analyte	053CB00401, mg/kg	053SB00401, mg/kg	RPD
aluminum	3270	3240	0.9
calcium	4150	4340	4.5
chromium	14.5	14.5	0
copper	19.3	25.2	26.5
iron	2860	3370	16.4
lead	18.4	16.9	8.5
nickel	4.6	4.4	4.4
manganese	35.0	36.0	2.8
mercury	0.23	0.28	19.6
zinc	61.0	60.6	0.7

The RPD's for copper and zinc in the first set of field duplicates exceeded the 60% QC limits for soil samples. The positive results for these two analytes in samples 053CB00301 and 053SB00301 were flagged as estimated (J). All criteria were met for the second set of field duplicates. No further action was taken.

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. 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:

All laboratory data were acceptable with qualifications.

# 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: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0089  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NUMBERS: 26203A (Level IV)  
26203B (Level III)

### SAMPLES:

#### 26203A (Level IV):

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/</u> <u>PCDF</u>
596HW00102	26204.01	Water	X
605HW00302	26215.01	Water	X
596DW00302	26242.01	Water	X
596EW00302	26242.02	Water	X
596FW00302	26242.03	Water	X

#### 26203B (Level III):

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/</u> <u>PCDF</u>
596GW00102	26203.05	Water	X
596GW00202	26214.03	Water	X
596GW00302	26243.02	Water	X
596GW00402	26214.04	Water	X

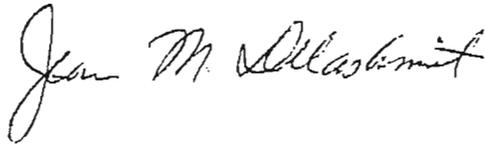
<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/</u> <u>PCDF</u>
596GW01D02	26203.06	Water	X
605GW00102	26203.04	Water	X
605GW00202	26214.05	Water	X
605GW00302	26214.06	Water	X

Fourth Digit Codes:

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK, H = FIELD DUPLICATE SAMPLE

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26203A/B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 596HW00102, 605HW00302, 596DW00302, 596EW00302, 596GW00102,  
596GW00202, 596GW00302, 596FW00302, 596GW00402, 596GW01D02,  
605GW00102, 605GW00202, 605GW00302

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Compared to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

The Percent Difference (%D) of 13C-1234678-HpCDD was 59.5% for the ending calibration verification run on 7/15/96 on instrument 70S, which exceeded the 35.0% QC limit. All associated positive sample results in samples 596HW00102, 605HW00302, 596GW00202, 596GW00402, 605GW00202 and 605GW00302 were flagged qualified as blank contamination. No further action was required.

IV.) Blanks

Method Blanks:

Several 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following highest concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
DFBLK1-4	1234678-HpCDD	6.9	35
	OCDD	34.5	173
	1234678-HpCDF	5.6	28
	OCDF	3.5	18

Detections of the above compounds in all associated samples below 5X the blank amounts were designated as EMPC (Estimated Maximum Possible Concentration).

Field Blanks:

Deionized water blank 596DW00302, equipment rinsate blank 596EW00302 and field blank 596FW00302 were analyzed. Several 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
596FW00302	1234678-HpCDD	7.8	39
	OCDD	37.3	187
	1234678-HpCDF	6.2	31
	OCDF	4.1	21

Detections of the above compound in all associated samples below 5X the blank amounts were designated as EMPC (Estimated Maximum Possible Concentration).

V.) Internal Standards Performance:

The Internal Standard Recoveries (%R's) were below the 40-135% QC limits in the following samples:

<u>Sample ID</u>	<u>Compound</u>	<u>%R</u>
596GW00102	13C-2378TCDD	26.45
	13C-2378TCDF	39.21
605GW00102	13C-1234678HpCDF	35.30
596GW00302	13C-1234678HpCDF	39.27

All associated positive sample results were flagged based on blank contamination. No further action was required.

VI.) Spike/Spike Duplicates:

No MS/MSD were analyzed. No action was taken.

One LCS sample was analyzed. All criteria were met. No action was taken.

VII.) Duplicates:

Field duplicate sample sets 596GW00102 / 596HW00102 and 605GW00302 / 605HW00302 were analyzed. The positive sample results were:

<u>Analyte</u>	<u>596GW00102, pg/L</u>	<u>596HW00102, pg/L</u>	<u>RPD</u>
1234678-HpCDD	4.97 *	5.45 *	n/c
OCDD	134 *	176 *	n/c
1234678-HpCDF	3.63 *	3.53 *	n/c
OCDF	2.04 *	2.05 *	n/c

<u>Analyte</u>	<u>605GW00302, pg/L</u>	<u>605HW00302, pg/L</u>	<u>RPD</u>
OCDD	20.5 *	14.2 *	n/c
1234678-HpCDF	3.28 *	1.72 *	n/c
OCDF	6.69 *	1.89 *	n/c

\* = EMPC

n/c = Not Calculable

Since all positive sample results were flagged as EMPC, the RPD's were not calculable. No action was necessary.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Laboratory "X" flags meaning "EMPC" were replaced with "EMPC" upon validation.

# VALIDATA

Chemical Services, Inc.

P. O. Box 930422, Norcross, GA 30093

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(770) 923-8769 (Fax)

## DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall  
SITE NAME: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0089  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994

SAMPLE MATRIX: Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals and Cyanide, Organotin, Chloride, Sulfate, Total Dissolved Solids (TDS)

SDG NUMBERS: 26203A (Appendix IX, Level IV)  
26203B (Level III)

### SAMPLES:

#### SDG 26203A (Level IV):

Client	Lab		Volatile	Semi-	Pesticides/	Metals/
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Cyanide</u>
596HW00102*	26204.01	Water				X
605HW00302*	26215.01	Water		X		X
596DW00302	26242.01	Water	X	X	X	X
596EW00302	26242.02	Water	X	X	X	X
596FW00302	26242.03	Water	X	X	X	X

Client	Lab		Organotin	Chloride	Sulfate	TDS
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>				
596HW00102*	26204.01	Water		X	X	X
605HW00302*	26215.01	Water	X	X	X	X
596DW00302	26242.01	Water	X	X	X	X
596EW00302	26242.02	Water	X	X	X	X
596FW00302	26242.03	Water	X	X	X	X
596DW00302RE	26242.01RE	Water	+			
596EW00302RE	26242.02RE	Water	+			
596FW00302RE	26242.03RE	Water	+			

\* = Field duplicates were associated with samples 596GW00102 and 605GW00302 in SDG 25603B.  
 + = Non-billable Reanalysis sample

SDG 26203 (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
GDEGW00102	26203.01	Water	X	X	X	X
GDEGW00202	26214.02	Water	X	X	X	X
GDEGW00302	26243.01	Water	X	X	X	X
GDEGW01D02	26214.01	Water	X	X	X	X
018GW00102	26203.02	Water		X		X
018GW00202	26203.03	Water		X		X
596GW00102*	26203.05	Water				X
596GW00202	26214.03	Water				X
596GW00302	26243.02	Water				X
596GW00402	26214.04	Water				X
596GW01D02	26203.06	Water				X
605GW00102	26203.04	Water		X		X
605GW00202	26214.05	Water		X		X
605GW00302*	26214.06	Water		X		X
GDETW00102	26203.07	Water	X			
GDETW00202	26214.07	Water	X			
GDETW00302	26243.03	Water	X			

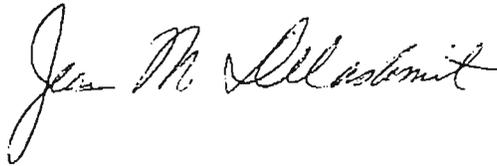
Client Sample #	Lab Sample #	Matrix	Organotin	Chloride	Sulfate	TDS
018GW00102	26203.02	Water	X	X	X	X
018GW00202	26203.03	Water	X	X	X	X
596GW00102*	26203.05	Water		X	X	X
596GW00202	26214.03	Water		X	X	X
596GW00302	26243.02	Water		X	X	X
596GW00402	26214.04	Water		X	X	X
596GW01D02	26203.06	Water		X	X	X
605GW00102	26203.04	Water	X	X	X	X
605GW00202	26214.05	Water	X	X	X	X
605GW00302*	26214.06	Water	X	X	X	X
GDEGW00102	26203.01	Water		X	X	X
GDEGW00202	26214.02	Water		X	X	X
GDEGW00302	26243.01	Water		X	X	X
GDEGW01D02	26214.01	Water		X	X	X

\* = Samples were associated with field duplicate samples 596HW00102 and 605HW00302 in SDG 25603A.

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, HW = FIELD DUPLICATE, RE = REANALYSIS, TW = TRIP BLANK

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

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large initial "J" and "M".

### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 26203A Appendix IX, CLP Organics and Inorganics

SAMPLES: 596HW00102, 605HW00302, 596DW00302, 596DW00302RE, 596EW00302,  
596EW00302RE, 596FW00302, 596GW00302RE

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factors (RRF's) for acrolein (0.013), acetonitrile (0.025), isobutyl alcohol (0.005) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the standards analyzed on 7/12/96 on instrument I. The results for these compounds in all blanks in this SDG, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/12/96 on instrument I for the following compounds:

bromomethane	33.7%
chloroethane	43.0%
trichlorofluoromethane	47.1%
1,4-dioxane	47.4%

The results for 1,4-dioxane in the associated blanks were previously rejected. Since the associated results for the other compounds were non-detects, no further action was required.

##### Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

Methylene chloride was detected at 2.0 ug/L in method blank VBLK1. No action was required since the associated samples were field blanks.

TIC's:

All TIC criteria were met, so no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane in the blanks in this SDG were rejected (R) due to low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for aramite (0.029) and hexachlorophene (0.048) were below the 0.050 QC limit for the standards analyzed on 7/16/96 on instrument A. The results for these compounds in associated sample 605HW00302 and blanks 596DW00302 and 596EW00302, which were non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/16/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
o-toluidine	30.3%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	34.4%
hexachloropropene	39.8%
1,2,4,5-tetrachlorobenzene	31.6%
saffrole	33.6%
1,4-napthaquinone	33.6%
1,3-dinitrobenzene	34.7%
pentachlorobenzene	32.3%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.6%
2-naphthylamine	33.7%
diphenylamine	31.6%

sulfotepp	35.8%
1,3,5-trinitrobenzene	31.9%
4-aminobiphenyl	30.3%
pronamide	34.0%
pentachloronitrobenzene	47.1%
disulfoton	30.4%
methyl parathion	36.1%
parathion	39.1%
methapyrilene	41.3%
isodrin	34.9%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
2-acetylaminofluorene	30.4%
7,12-dimethylbenz(a)anthracene	48.0%

These compounds were not detected in the associated samples or blanks. No action was required.

The average Relative Response Factors (RRF's) for aramite (0.029) and hexachlorophene (0.048) were below the 0.050 QC limit for the standards analyzed on 7/26/96 on instrument A. The non-detect results for these compounds in associated field blank 596FW00302 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/26/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
o-toluidine	30.3%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	34.4%
hexachloropropene	39.8%
1,2,4,5-tetrachlorobenzene	31.6%
safrole	33.6%
1,4-napthaquinone	33.6%
1,3-dinitrobenzene	34.7%
pentachlorobenzene	32.3%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.6%
2-naphthylamine	33.7%
diphenylamine	31.6%
sulfotepp	35.8%
1,3,5-trinitrobenzene	31.9%
4-aminobiphenyl	30.3%
pronamide	34.0%

pentachloronitrobenzene	47.1%
disulfoton	30.4%
methyl parathion	36.1%
parathion	39.1%
methapyrilene	41.3%
isodrin	34.9%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
2-acetylaminofluorene	30.4%
7,12-dimethylbenz(a)anthracene	48.0%

These compounds were not detected in the associated samples. No action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 7/16/96 at 08:07 on instrument A for aramite (0.042) and hexachlorophene (0.041). The results for these compounds in the associated samples were previously rejected, so no further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 08:07 on instrument A for the following compounds:

2,6-dichlorophenol	53.7%
hexachloropropene	34.5%
1,2,4,5-tetrachlorobenzene	50.8%
hexachlorocyclopentadiene	40.6%
2,4-dinitrophenol	41.9%
pentachlorobenzene	36.0%
4,6-dinitro-2-methylphenol	28.8%
aramite	39.7%
pyridine	41.4%
n-nitrosodimethylamine	40.9%
n-nitrosomethylethylamine	54.5%
n-nitrosodiethylamine	51.2%
2-picoline	32.9%
acetophenone	55.3%
n-nitrosopyrrolidine	58.5%
n-nitrosomorpholine	41.9%
o-toluidine	41.2%
1-nitroso-piperidine	67.9%
o,o,o-triethyl phosphorothionate	56.0%
n-nitrosodi-n-butylamine	75.1%
safrole	89.8%
isosafrole	59.6%
1,4-napthoquinone	61.5%
1,3-dinitrobenzene	63.5%
2,4-dinitrotoluene	28.4%

2-naphthylamine	35.2%
thionazin	52.5%
phorate	40.9%
phenacetin	57.6%
diallate	73.6%
dimethoate	45.2%
4-aminobiphenyl	44.7%
pronamide	42.8%
pentachloronitrobenzene	86.1%
disulfoton	29.6%
methyl parathion	64.0%
parathion	80.2%
isodrin	62.1%
chlorobenzilate	76.4%
3,3'-dimethylbenzidine	92.6%
famphur	118%
m-cresol	43.8%
4-nitroquinoline-1-oxide	74.5%
diphenylamine	42.8%
kepone	114%
7,12-dimethylbenz(a)anthracene	90.2%
1,3,5-trinitrobenzene	27.2%

The results for these compounds in associated sample 605HW00302, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factors (RRF's) for aramite (0.043) and hexachlorophene (0.034) were below the 0.050 QC limit for the standards analyzed on 7/26/96 at 11:26 on instrument A. The non-detect results for these compounds were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/26/96 at 11:26 for the following compounds:

2,6-dichlorophenol	79.9%
hexachloropropene	53.7%
1,2,4,5-tetrachlorobenzene	39.8%
2,4-dinitrophenol	61.2%
pentachlorobenzene	28.1%
4,6-dinitro-2-methylphenol	52.8%
aramite	43.3%
n-nitrosodiethylamine	57.9%
ethyl methanesulfonate	69.1%
2-picoline	53.8%
nitrobenzene	25.6%
acetophenone	65.0%
n-nitrosopyrrolidine	39.7%
n-nitrosomorpholine	50.7%

o-toluidine	55.0%
1-nitroso-piperidine	70.7%
o,o,o-triethyl phosphorothionate	87.8%
n-nitroso-di-n-butylamine	77.1%
safrole	62.1%
isosafrole	64.3%
1,4-naphthoquinone	53.4%
1,3-dinitrobenzene	39.3%
1-naphthylamine	62.6%
2-naphthylamine	67.3%
thionazin	117%
phorate	78.5%
phenacetin	115%
diallate	41.7%
dimethoate	95.2%
4-aminobiphenyl	74.2%
pronamide	28.3%
pentachloronitrobenzene	109%
disulfoton	65.9%
methyl parathion	79.2%
parathion	104%
methapyrilene	172%
isodrin	72.0%
chlorobenzilate	97.9%
3,3'-dimethylbenzidine	105%
famphur	117%
m-cresol	67.1%
4-nitroquinoline-1-oxide	55.7%
diphenylamine	57.5%
sulfotepp	54.4%
kepone	92.0%
7,12-dimethylbenz(a)anthracene	63.3%
hexachlorophene	30.5%
1,3,5-trinitrobenzene	70.5%
p-phenylenediamine	31.4%

No action was taken, since the associated sample was a field blank.

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 12.0 ug/L in method blank SBLK1. The associated positive sample result for this compound less than 10X the blank amount was flagged as undetected (U) with the result being raised to the CRQL.

Deionized Water Blank:

There were no positive detections in the deionized water blank. No action was taken.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was required.

Field Blank:

Bis(2-ethylhexyl)phthalate was detected at 2.0 ug/L in field blank 596FW00302. All results for this compound in the associated sample was previously flagged based on the method blank. No further action was necessary.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2-fluorophenol (14%) was below the 21-110% QC limits for deionized water blank 596DW00302. Since only one surrogate was below the QC limits, no action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene were rejected in all samples and blanks due to very low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/17/96 at 07:10 on the primary column for alpha-BHC (37.0%), beta-BHC (33.0%), gamma-BHC (38.0%) and endrin (45.8%). No action was taken, since the associated samples were field blanks.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/17/96 at 07:10 on the secondary column for alpha-BHC (31.0%), beta-BHC (28.0%), gamma-BHC (29.0%) and endrin (34.8%). No action was taken, since the associated samples were field blanks.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 01:47 for endrin on the primary column (28.8%). No action was taken, since the associated samples were field blanks.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 17:28 on the primary column for alpha-BHC (29.0%), beta-BHC (26.0%), gamma-BHC (28.0%) and endrin (31.8%). No action was taken, since the associated samples were field blanks.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 17:28 on the secondary column for alpha-BHC (29.0%), beta-BHC (27.0%), gamma-BHC (28.0%) and endrin (35.6%). No action was taken, since the associated samples were field blanks.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All %R criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was taken.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>5X Conc.</u>
596DW00302	aluminum	47.5 ug/L	238 ug/L
596DW00302	barium	131 ug/L	655 ug/L
596DW00302	calcium	1290 ug/L	6450 ug/L
PBW	copper	10.0 ug/L	50.0 ug/L
596DW00302	lead	4.80 ug/L	24.0 ug/L
596DW00302	magnesium	150 ug/L	750 ug/L
596DW00302	manganese	5.20 ug/L	26.0 ug/L
596DW00302	potassium	2440 ug/L	12200 ug/L
596DW00302	sodium	22400 ug/L	112000 ug/L
596DW00302	zinc	7.50 ug/L	37.5 ug/L

DW = Deionized Water Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amounts ( Action level, ug/L for water samples) for which the contaminated blank was an associated preparation or deionized water blank were flagged as undetected (U).

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:

copper	16 ug/L
silver	6 ug/L
tin	22 ug/L

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

Negative results were observed for antimony (-96 ug/L), cadmium (-4 ug/L), chromium (-6 ug/L), manganese (-6 ug/L), nickel (-2 ug/L), thallium (-8 ug/L) and vanadium (-17 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

There were no Serial Dilution samples analyzed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There were no Duplicate Sample Analyses in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spikes analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Sample 596HW00102 and 605HW00302 were analyzed in this SDG, while corresponding samples 596GW00102 and 605GW00302 were analyzed in SDG 26203B. Reference SDG 25203B for RPD tabulations. All RPD's were within the 30% QC limit for water samples, so no action was required.

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. 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:

All laboratory data were acceptable with qualifications.

*ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for tetrabutyltin (0.040) was below the 0.050 QC limit for the standard analyzed on 7/24/96 at 15:13 on instrument J. The results for this compound in the associated sample and blanks were rejected (R).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Deionized Water Blank:

There were no positive detections in the deionized water blank. No action was necessary.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was necessary.

Field Blank:

There were no positive detections in the field blank in this SDG. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) were below the 10-160% QC limits for tripropyltin in samples 596DW00302 (4%), 596EW00302 (3%) and 596FW00302 (7%). No action was taken, since these samples were field blanks.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for organotin compounds in the field duplicate samples. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for tetrabutyltin in the samples in this SDG were rejected (R) due to low RRF's in the continuing calibration. The original analyses of the samples in this SDG were considered by the validator to be of preferable data quality to the reanalyses because of their better holding times. All other laboratory data were acceptable with qualifications.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks in this SDG. No action was required.

Field Blanks:

Sulfate was detected at 3.0 ug/L in deionized water blank 596DW00302, 2.6 ug/L equipment rinsate blank 596EW00302 and 2.5 ug/L in field blank 596FW00302. All positive detections of this compound in the samples in this SDG, less than 5X the highest blank amount, were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 0.7% for sulfate in field duplicate samples 596HW00102 and 596GW00102 (analyzed in SDG 26203B). Since the RPD was within the 30% QC limit for water samples, no action was required.

The RPD for sulfate in field duplicate samples 605HW00302 and 605GW00302 (analyzed in SDG 26203B) was not calculable. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Field Blanks:

Chloride was detected at 25.3 ug/L in deionized water blank 596DW00302. All positive results for chloride in the samples in this SDG less than 5X the blank amount were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

Chloride was detected at 23.4 ug/L in equipment rinsate blank 596EW00302. All positive results for chloride in the associated samples were previously flagged. No further action was required.

Chloride was detected at 22.1 ug/L in field blank 596FW00302. All positive results for chloride in the associated samples were previously flagged. No further action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

No MS / MSD analyses were performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides in field duplicate samples 596HW00102 and 596GW00102 (analyzed in SDG 26203B) was not calculable. No action was required.

The RPD for field duplicate samples 605HW00302 and 605GW00302 (analyzed in SDG 26203B) was not calculable. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water Blank:

TDS was detected at 96 mg/L in deionized water blank 596DW00302. All positive results for TDS in the samples in this SDG less than 5X the blank amount were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

Equipment Rinsate Blank:

TDS was detected at 89 mg/L in equipment rinsate blank 596EW00302. The results for TDS in the associated samples were previously flagged. No action was required.

Field Blank:

TDS was detected at 84 mg/L in field blank 596FW00302. The results for TDS in the associated samples were previously flagged. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 6.7% for field duplicate samples 596HW00102 and 596GW00102 (analyzed in SDG 26203B). The RPD was 2.8% for field duplicate samples 605HW00302 and 605GW00302 (analyzed in SDG 26203B). Since these RPD's were within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26203 Level III, CLP Organics and Inorganics

SAMPLES: 018GW00102, 018GW00202, 596GW00102, 596GW00202, 596GW00302, 596GW00402, 596GW01D02, 605GW00102, 605GW00202, 605GW00302, GDEGW00102, GDEGW00202, GDEGW0032, GDEGW01D02, GDETW00202, GDETW00302,

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/12/96 on instrument I for the following compounds:

bromomethane	33.7%
chloroethane	43.0%

Since these compounds were not detected in the associated samples, no action was required.

The average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 7/08/96 on instrument R for vinyl acetate (0.044) and 2-chloroethyl vinyl ether (0.040). The results for these compounds in associated samples GDEGW01D2 and GDEGW00202 and trip blank GDETW00202, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/08/96 on instrument R for the following compounds:

2-chloroethyl vinyl ether	41.8%
bromomethane	32.4%
acetone	35.0%

The results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. There were no positive results for the other compounds in the associated samples after blank qualification, so no action was necessary.

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 6/21/96 on instrument U for bromomethane (39.8%). Since this compound was not detected in the associated samples, no action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standard analyzed on 7/10/96 at 19:06 on instrument R for vinyl acetate (0.024) and 2-chloroethyl vinyl ether (0.036). The results for these compounds in the associated samples were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/10/96 at 19:06 on instrument R for vinyl acetate (45.5%) and acetone (26.7%). The results for vinyl acetate in the associated samples were previously rejected. The detections of acetone in associated samples GDEGW01D02 and GDEGW00202 were determined to be blank contamination and were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/03/96 on instrument U for the following compounds:

chloromethane	30.4%
vinyl acetate	82.9%
bromoform	25.2%
2-chloroethyl vinyl ether	40.5%

The results for these compounds in associated sample GDEGW00102, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

Chloroform was detected at 1.0 ug/L in method blank VBLK1. This compound was not detected in the associated samples. No action was required.

Methylene chloride was detected at 2.0 ug/L in method blank VBLK2. The positive results for this compound in associated samples GDEGW01D02 and GDEGW00202, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL.

Methylene chloride was detected at 2.0 ug/L in method blank VBLK3. This compound was not detected in the associated sample, so no action was required.

##### Trip Blanks:

Methylene chloride was detected at 1.0 ug/L in trip blank GDETW00302. The results for methylene chloride in the associated samples were previously flagged based on the method blanks. No further action was required.

Methylene chloride, acetone and 1,2-dichloroethene were detected at 1.0 ug/L, 13.0 ug/L and 1.0 ug/L, respectively, in trip blank GDETW00202. The positive results for methylene chloride in the associated samples were previously flagged based on the method blanks. The positive results for acetone in associated samples GDEGW00202 and GDEGW01D02, which were less than 10X the blank amount, were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample. The positive results for 1,2-dichloroethene in associated samples GDEGW00202 and GDEGW01D02, which were less than 5X the blank amount, were flagged as undetected (U) with the analytical result being raised to the CRQL.

TIC's:

All TIC criteria were met, so no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

No MS / MSD analyses were performed for this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for vinyl acetate and 2-chloroethyl vinyl ether in samples GDEGW01D02 and GDEGW00202 and trip blank GDETW00202 were rejected due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 7/19/96 on instrument A for the following compounds:

hexachlorocyclopentadiene	37.1%
2,6-dinitrotoluene	33.8%
2,4-dinitrophenol	32.4%
2,4-dinitrotoluene	34.2%

Since these compounds were not detected in the associated samples, no action was necessary.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/23/96 on instrument A for 2,4-dinitrotoluene (33.1%) and pyridine (32.5%). Since these compounds were not detected in the associated samples, no action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/26/96 at 07:41 on instrument A for the following compounds:

1,2-dichlorobenzene	28.1%
naphthalene	25.2%
2,4-dinitrophenol	26.5%

The results for these compounds in associated sample GDEGW00302, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 8.0 ug/L in method blank SBLK1. All positive results for bis(2-ethylhexyl)phthalate in associated samples GDEGW00102, 018GW00102, 018GW00202 and 605GW00102 less than 10X the blank amount were flagged as undetected (U) with the quantitation limit being raised to the level of contamination in each sample.

Bis(2-ethylhexyl)phthalate was detected at 12.0 ug/L in method blank SBLK2. All positive results for bis(2-ethylhexyl)phthalate in associated samples GDEGW01D02, GDEGW00202, 605GW00202 and 605GW00302, less than 10X the blank amount were flagged as undetected (U) with the quantitation limit being raised to the level of contamination in each sample.

##### Field Blank:

Bis(2-ethylhexyl)phthalate was detected at 2.0 ug/L in field blank 596FW00302 (analyzed in SDG 25203A). The results for this compound in the associated samples were previously flagged based on the method blanks. No further action was required.

##### TIC's:

All TIC criteria were met, so no action was necessary.

#### V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2-fluorophenol (18%) was below the 21-110% QC limits for sample 605GW00102. Since only one acid surrogate was outside the QC limits, no action was taken.

#### VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

#### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

#### VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the associated field duplicate samples. No action was required.

#### IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/17/96 at 07:10 on the primary column for alpha-BHC (37.0%), beta-BHC (33.0%), gamma-BHC (38.0%) and endrin (45.8%). The results for these compounds in the samples in this SDG, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/17/96 at 07:10 on the secondary column for alpha-BHC (31.0%), beta-BHC (28.0%), gamma-BHC (29.0%) and endrin (34.8%). The results for these compounds in the samples in this SDG were previously flagged, so no further action was required.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 01:47 for endrin on the primary column (28.8%). The results for these compounds in the samples in this SDG were previously flagged, so no further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 17:28 on the primary column for alpha-BHC (29.0%), beta-BHC (26.0%), gamma-BHC (28.0%) and endrin (31.8%). The results for these compounds in the samples in this SDG were previously flagged, so no further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 17:28 on the secondary column for alpha-BHC (29.0%), beta-BHC (27.0%), gamma-BHC (28.0%) and endrin (35.6%). The results for these compounds in the samples in this SDG were previously flagged, so no further action was required.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in the associated field blanks, analyzed in SDG 26203A. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was taken.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

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

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>5X Conc.</u>
596DW00302	aluminum	47.5 ug/L	238 ug/L
596DW00302	barium	131 ug/L	655 ug/L
596DW00302	calcium	1290 ug/L	6450 ug/L
PBW	copper	10.0 ug/L	50.0 ug/L
596DW00302	lead	4.80 ug/L	24.0 ug/L
596DW00302	magnesium	150 ug/L	750 ug/L
596DW00302	manganese	5.20 ug/L	26.0 ug/L
596DW00302	potassium	2440 ug/L	12200 ug/L
596DW00302	sodium	22400 ug/L	112000 ug/L
596DW00302	zinc	7.50 ug/L	37.5 ug/L

DW = Deionized Water Blank (analyzed in SDG 26203A), PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amounts (Action level, ug/L for water samples) for which the contaminated blank was an associated preparation or deionized water blank were flagged as undetected (U).

IV.) ICP Interference Check Sample Results:

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

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

copper	16 ug/L
silver	6 ug/L
tin	22 ug/L

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

Negative results were observed for antimony (-96 ug/L), cadmium (-4 ug/L), chromium (-6 ug/L), manganese (-6 ug/L), nickel (-2 ug/L), thallium (-8 ug/L) and vanadium (-17 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There were no Duplicate Sample Analyses in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spikes analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Sample 596GW00102 and 605GW00302 were analyzed in this SDG, while field duplicate samples 596HW00102 and 605HW00302 were analyzed in SDG 26203A. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>596GW00102, ug/L</u>	<u>596HW00102, ug/L</u>	<u>RPD</u>
aluminum	7570	6730	11.7
arsenic	17.8	16.6	7.0
calcium	82700	77800	6.1
iron	17800	15400	14.4
magnesium	14300	13700	2.8
manganese	255	241	5.6

<u>Analyte</u>	<u>605GW00302, ug/L</u>	<u>605HW00302, ug/L</u>	<u>RPD</u>
arsenic	85.5	85.3	0.2
calcium	86100	84600	1.8
iron	7850	7720	1.7
magnesium	12100	12000	0.8
manganese	228	224	1.8

All RPD's were within the 30% QC limit for water samples, so no action was required.

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. 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:

All laboratory data were acceptable with qualifications.

#### *ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for tetrabutyltin (0.040) was below the 0.050 QC limit for the standard analyzed on 7/24/96 at 15:13 on instrument J. All non-detect results for this compound in the samples in this SDG were rejected (R).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blanks:

There were no positive detections in the associated field blanks, analyzed in SDG 26203A. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the associated field duplicate samples. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for tetrabutyltin in the samples in this SDG were rejected (R) due to low RRF's in the continuing calibration. All other laboratory data were acceptable without qualifications.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks in this SDG. No action was required.

Field Blanks:

Sulfate was detected at 3.0 ug/L in deionized water blank 596DW00302, 2.6 ug/L in equipment rinsate blank 596EW00302 and 2.5 ug/L in field blank 596FW00302 (all analyzed in SDG 26203A). All detections of sulfate in the samples in this SDG less than 5X the highest blank amount were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 0.7% for sulfate in field duplicate samples 596GW00102 and 596HW00102 (analyzed in SDG 26203A). Since the RPD was within the 30% QC limit for water samples, no action was required.

The RPD for sulfate in field duplicate samples 605GW00302 and 605HW00302 (analyzed in SDG 26203A) was not calculable. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Field Blanks:

Chloride was detected at 25.3 ug/L in deionized water blank 596DW00302 (analyzed in SDG 26203A). All positive results for chloride in the samples in this SDG, less than 5X the blank amount, were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

Chloride was detected at 23.4 ug/L in equipment rinsate blank 596EW00302 (analyzed in SDG 26203A). The associated sample results were previously flagged. No further action was required.

Chloride was detected at 22.1 ug/L in field blank 596FW00302 (analyzed in SDG 26203A). The associated sample results were previously qualified. No further action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides in field duplicate samples 596GW00102 and 596HW00102 (analyzed in SDG 26203A) was not calculable. No action was required.

The RPD for field duplicate samples 605GW00302 and 605HW00302 (analyzed in SDG 26203A) was not calculable. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Field Blanks:

TDS was detected at 96 mg/L in deionized water blank 596DW00302, analyzed in SDG 26203A. All positive results for this compound in the samples in this SDG were greater than 5X the blank amount. No action was required.

TDS was detected at 89 mg/L in equipment rinsate blank 596EW00302 and at 84 mg/L in field blank 596FW00302 (both analyzed in SDG 26203A). The higher level of contamination in the deionized water blank was used for blank evaluation. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 6.7% for TDS in field duplicate samples 596GW00102 and 596HW00102 (analyzed in SDG 26203A). The RPD was 2.8% for TDS in field duplicate samples 605GW00302 and 605HW00302 (analyzed in SDG 26203A). Since the RPD's were within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualifications.

# 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: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0090  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's  
  
SDG NUMBER: 26253A (Level IV)

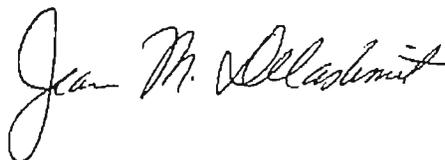
### SAMPLES:

<u>Client</u>	<u>Lab</u>	<u>Matrix</u>	<u>PCDD/ PCDF</u>
Sample #	Sample #		
GDEHW00502	26268.02	Water	X
GDEHW00502 RE	26268.02	Water	+
GDEHW04D02	26268.01	Water	+
GDEHW04D02 RE	26268.01	Water	X
580HW00202	26268.03	Water	+
580HW00202 RE	26268.03	Water	X
596GW04D02	26253.07	Water	+
596GW04D02 RE	26253.07	Water	X

+ = Non-billable Analysis  
RE = REANALYSIS

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26253A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: GDEHW00502 RE, GDEHW04D02, 580HW00202 RE, 596GW04D02 RE

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Compared to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Several 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
DFBLK1	1234678-HpCDD	1.7	8
	OCDD	10.5	53
	234678-HxCDF	2.3	12
	1234678-HpCDF	2.5	13
	OCDF	3.8	19

Detections of the above compounds in all associated samples below 5X the blank amounts (Action Level) were designated as EMPC (Estimated Maximum Possible Concentration).

Field Blanks:

No field blanks were analyzed in this SDG. No action was taken.

V.) Internal Standards Performance:

Several Internal Standard Recoveries (%R's) for samples GDEHW04D02, 580HW00202 and 596GW04D02 were below the 40-135% QC limits. The samples were re-extracted and reanalyzed. All criteria were met for the three reanalyses, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD were analyzed.

One LCS sample was analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

The corresponding samples for field duplicates 580HW00202, GDEHW00502 and GDEHW04D02 were not analyzed in this SDG. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

There were no report forms submitted in the data package for sample 596GW04D02 RE. Since there were no positive results for this sample, no action was taken. In the professional judgement of the validator, using the information in the raw data, the reanalysis was of preferable data quality to the original analysis.

Three samples were reanalyzed because of poor internal standard performances in the original analyses. The reanalyses of these samples were considered by the validator to be of preferable data quality and were selected for validation because of improved internal standard recoveries. The original analysis of GDEHW00502 was selected.

All data were acceptable with qualifications. Laboratory "X" flags meaning "EMPC" were replaced with "EMPC" upon validation.

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0090  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals and Cyanide, Organotin, Chloride, Sulfate, Total Dissolved Solids (TDS)  
SDG NUMBERS: 26253A (Appendix IX, Level IV)  
26253B (Level III)

### SAMPLES:

#### SDG 26253A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
580HW00202**	26268.03	Water	X			X*
GDEHW00502**	26268.02	Water	X	X	X	X
GDEHW04D02**	26268.01	Water	X	X	X	X
GDEHW00502RE	26268.02RE	Water		+		
GDEHW04D02RE	26268.01RE	Water		+		

Client Sample #	Lab Sample #	Matrix	Chloride	Sulfate	TDS
580HW00202**	26268.03	Water	X	X	X
GDEHW00502**	26268.02	Water	X	X	X
GDEHW04D02**	26268.01	Water	X	X	X

\* - Total Metals Analysis only

\*\* - Field duplicates were associated with samples 580GW00202, GDEGW00502 and GDEGW04D02 in SDG 25253B.

SDG 26253 (Level III):

Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Volatile Organics</u>	<u>Semi- volatiles</u>	<u>Pesticides/ PCB's</u>	<u>Metals/ Cyanide</u>
097GW00102	26267.07	Water				X*
580GW00102	26267.03	Water	X			X*
580GW00202	26267.05	Water	X			X*
580GW01D02	26267.04	Water	X			X*
GDEGW00402	26253.03	Water	X	X	X	X
GDEGW00502	26267.02	Water	X	X	X	X
GDEGW02D02	26253.01	Water	X	X	X	X
GDEGW03D02	26253.02	Water	X	X	X	X
GDEGW04D02	26267.01	Water	X	X	X	X
GDEIW00402	26253.10	Water	X			
GDEIW00502	26267.08	Water	X			
106GW00102	26253.04	Water		X		X*
106GW01D02	26253.05	Water		X		X*
586GW00102	26267.06	Water		X		X*
598GW00102	26253.06	Water		X		
590GW00102	26253.08	Water				X*
590GW01D02	26253.09	Water				X*
596GW04D02	26253.07	Water				X*
598GW00102	26253.06	Water				X*
586GW00102RE	26267.06RE	Water		+		
GDEGW00402RE	26253.03RE	Water		+		
GDEGW00502RE	26267.02RE	Water		+		
GDEGW02D02RE	26253.01RE	Water		+		
GDEGW03D02RE	26253.02RE	Water		+		
GDEGW04D02RE	26267.01RE	Water		+		

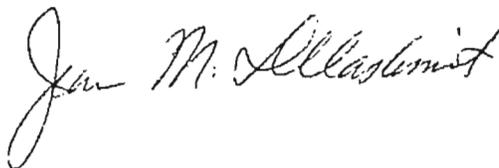
Client <u>Sample #</u>	Lab <u>Sample #</u>	<u>Matrix</u>	<u>Organotin</u>	<u>Chloride</u>	<u>Sulfate</u>	<u>TDS</u>
097GW00102	26267.07	Water	X	X	X	X
106GW00102	26253.04	Water	X	X	X	X
106GW01D02	26253.05	Water		X	X	X
580GW00102	26267.03	Water		X	X	X
580GW00202	26267.05	Water		X	X	X
580GW01D02	26267.04	Water		X	X	X
586GW00102	26267.06	Water		X	X	X
590GW00102	26253.08	Water		X	X	X
590GW01D02	26253.09	Water		X	X	X
596GW04D02	26253.07	Water		X	X	X
598GW00102	26253.06	Water		X	X	X
GDEGW00402	26253.03	Water		X	X	X
GDEGW00502	26267.02	Water		X	X	X
GDEGW02D02	26253.01	Water		X	X	X
GDEGW03D02	26253.02	Water		X	X	X
GDEGW04D02	26267.01	Water		X	X	X

- \* - Total Metals Analysis only
- \*\* - Field duplicates were associated with samples 580HW00202, GDEHW00502 and GDEHW04D02 in SDG 25253A.
- + - Non-billable Reanalysis sample

H = FIELD DUPLICATE SAMPLE, T = TRIP BLANK

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

RELEASE SIGNATURE:

A handwritten signature in black ink, appearing to read "Jean M. Delashmit". The signature is written in a cursive style with a large, looping initial "J".

### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 26253A Appendix IX, CLP Organics and Inorganics

SAMPLES: 580HW00202, GDEHW00502, GDEHW00502RE, GDEHW04D02, GDEHW04D02RE

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 7/12/96 on instrument I for acrolein (0.013), acetonitrile (0.025), isobutyl alcohol (0.005) and 1,4-dioxane (0.002). The results for these compounds in all samples in this SDG, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/12/96 on instrument I for the following compounds:

bromomethane	33.7%
chloroethane	43.0%
trichlorofluoromethane	47.1%
1,4-dioxane	47.4%

The results for 1,4-dioxane in the associated samples were previously rejected. Since the other compounds were not detected in the associated samples, no further action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

#### IV.) Blanks:

Method Blanks:

Methylene chloride was detected at 2.0 ug/L in method blank VBLK1. All positive results for this

compound in the samples in this SDG less than 10X the blank amount were flagged as undetected (U).

Trip Blanks:

Methylene chloride, acetone and 2-butanone were detected at 4.0 ug/L, 24.0 ug/L and 7.0 ug/L, respectively, in trip blank GDETW00502, which was analyzed in SDG 26253B. The results for methylene chloride were previously qualified based on the method blanks. All positive results for acetone in the samples in this SDG, less than 10X the blank amount, were flagged as undetected (U) with the detection limits being raised to the level of contamination in each sample. There were no detections of 2-butanone in the associated samples, so no action was required.

TIC's:

All TIC criteria were met, so no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the associated field duplicate samples. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane in the samples in this SDG were rejected (R) due to low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for aramite (0.029) and hexachlorophene (0.048) were below the 0.050 QC limit for the standards analyzed on 7/26/96 on instrument A. The results for these compounds in the samples in this SDG, which were non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/26/96 on instrument A for the following compounds:

methyl methanesulfonate	33.2%
n-nitrodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.8%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
o-toluidine	30.3%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	34.4%
hexachloropropene	39.8%
1,2,4,5-tetrachlorobenzene	31.6%
saffrole	33.6%
1,4-naphthoquinone	33.6%
1,3-dinitrobenzene	34.7%
pentachlorobenzene	32.3%
1-naphthylamine	35.9%

4-nitroquinoline-1-oxide	39.6%
2-naphthylamine	33.7%
diphenylamine	31.6%
sulfotepp	35.8%
1,3,5-trinitrobenzene	31.9%
4-aminobiphenyl	30.3%
pronamide	34.0%
pentachloronitrobenzene	47.1%
disulfoton	30.4%
methyl parathion	36.1%
parathion	39.1%
methapyrilene	41.3%
isodrin	34.9%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
2-acetylaminofluorene	30.4%
7,12-dimethylbenz(a)anthracene	48.0%

These compounds were not detected in the associated samples. No action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.043) and hexachlorophene (0.034) were below the 0.050 QC limit for the standards analyzed on 7/26/96 at 11:26 on instrument A. The non-detect results for these compounds were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/26/96 at 11:26 for the following compounds:

2,6-dichlorophenol	79.9%
hexachloropropene	53.7%
1,2,4,5-tetrachlorobenzene	39.8%
2,4-dinitrophenol	61.2%
pentachlorobenzene	28.1%
4,6-dinitro-2-methylphenol	52.8%
aramite	43.3%
n-nitrosodiethylamine	57.9%
ethyl methanesulfonate	69.1%
2-picoline	53.8%
nitrobenzene	25.6%
acetophenone	65.0%
n-nitrosopyrrolidine	39.7%
n-nitrosomorpholine	50.7%
o-toluidine	55.0%
1-nitroso-piperidine	70.7%
o,o,o-triethyl phosphorothionate	87.8%

n-nitroso-di-n-butylamine	77.1%
safrole	62.1%
isosafrole	64.3%
1,4-napthoquinone	53.4%
1,3-dinitrobenzene	39.3%
1-naphthylamine	62.6%
2-naphthylamine	67.3%
thionazin	117%
phorate	78.5%
phenacetin	115%
diallate	41.7%
dimethoate	95.2%
4-aminobiphenyl	74.2%
pronamide	28.3%
pentachloronitrobenzene	109%
disulfoton	65.9%
methyl parathion	79.2%
parathion	104%
methapyrilene	172%
isodrin	72.0%
chlorobenzilate	97.9%
3,3'-dimethylbenzidine	105%
famphur	117%
m-cresol	67.1%
4-nitroquinoline-1-oxide	55.7%
diphenylamine	57.5%
sulfotepp	54.4%
kepone	92.0%
7,12-dimethylbenz(a)anthracene	63.3%
hexachlorophene	30.5%
1,3,5-trinitrobenzene	70.5%
p-phenylenediamine	31.4%

The non-detect results for aramite and hexachlorophene were previously rejected based on low RRF's in the initial calibration. The associated sample results for the other compounds, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 4 ug/L in method blank SBLK1. All positive results for this compound in the samples in this SDG, less than 10X the blank amount, were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL.

##### TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the associated field duplicate samples. No action was required.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene were rejected in all samples due to very low RRF's. The original analyses of samples GDEHW00502 and GEHW04D02 were considered by the validator to be of preferable data quality to the reanalyses and were selected for validation because of better holding times. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/17/96 at 07:10 on the primary column for alpha-BHC (37.0%), beta-BHC (33.0%), gamma-BHC (38.0%) and endrin (45.8%). All results for these compounds in the samples in this SDG, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/17/96 at 07:10 on the secondary column for alpha-BHC (31.0%), beta-BHC (28.0%), gamma-BHC (29.0%) and endrin (34.8%). The results for these compounds in the associated samples were previously flagged, so no action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 01:47 for endrin on the primary (28.8%) and secondary (27.8%) columns. All results for endrin in the associated samples were previously flagged. No further action was required.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 17:28 on the primary column for endrin (27.6%). All results for this compound in the associated samples were previously flagged as estimated. No further action was necessary.

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses in this SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples associated with this SDG. No action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was taken.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

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

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>5X Conc.</u>
CCB2	antimony	3.30 ug/L	16.5 ug/L
CCB3	copper	1.30 ug/L	6.50 ug/L
PBW	zinc	8.80 ug/L	44.0 ug/L
PBW	cyanide	2.75 ug/L	13.8 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amounts (Action level, ug/L for water 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 in the second continuing calibration blank (CCB2):

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB2	barium	-0.40 ug/L	2.00 ug/L
CCB2	selenium	-3.00 ug/L	15.0 ug/L
CCB2	thallium	-4.30 ug/L	21.5 ug/L

All associated positive sample results less than 5X the absolute value of the negative blank result and all 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 detected in ICS Solution A at concentrations greater than the IDL:

chromium	1 ug/L
thallium	6 ug/L

These analytes should not be present. Additionally, negative results were observed for antimony (-3 ug/L), arsenic (-6 ug/L), barium (-2 ug/L), cadmium (-1 ug/L), cobalt (-1 ug/L) and manganese (-1 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

There were no Serial Dilution samples analyzed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There were no Duplicate Sample Analyses in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spikes analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Samples 580HW00202, GDEHW00502 and GDEHW04D02 were analyzed in this SDG, while corresponding samples 580GW00202, GDEGW00502 and GDEGW04D02 were analyzed in SDG 26253B. The calculable Relative Percent Differences (RPD's) for these field duplicate pairs were:

<u>Analyte</u>	<u>580GW00202, ug/L</u>	<u>580HW00202, ug/L</u>	<u>RPD</u>
aluminum	131	160	19.9
arsenic	9.7	12.7	26.8
barium	7.2	7.4	2.7
calcium	11700	11600	0.8
iron	7870	7940	0.8
magnesium	4000	4130	3.2
manganese	88.4	88.5	0.1
potassium	3060	3160	3.2
sodium	43100	44700	3.6

<u>Analyte</u>	<u>GDEGW00502, ug/L</u>	<u>GDEHW00502, ug/L</u>	<u>RPD</u>
barium	173	170	1.7
calcium	126000	124000	1.6
iron	9500	9420	0.8
magnesium	236000	219000	7.5
manganese	412	407	1.2
potassium	100000	92700	7.6
sodium	2670000	2630000	1.5

<u>Analyte</u>	<u>GDEGW04D02, ug/L</u>	<u>GDEHW04D02, ug/L</u>	<u>RPD</u>
barium	64.9	65.3	0.6
calcium	222000	224000	0.8
magnesium	241000	232000	3.8
manganese	344	348	1.2
potassium	26900	26500	1.5
sodium	1860000	1850000	0.5

No action was required since all RPD's were within the 30% QC limit for water samples.

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. 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:

All laboratory data were acceptable with qualifications.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks in this SDG. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

No MS / MSD analyses were performed for this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 0.7% for sulfate in field duplicate samples 580HW00202 and 580GW00202 (analyzed in SDG 26253B). The RPD was 2.9% for field duplicate samples GDEHW00502 and GDEGW00502 (analyzed in SDG 26253B). The RPD was 1.7% for field duplicate samples GDEHW04D02 and GDEGW04D02 (analyzed in SDG 26253B). Since these RPD's were within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 9.5% for chlorides in field duplicate samples 580HW00202 and 580GW00202 (analyzed in SDG 26253B). The RPD was 0.8% for field duplicate samples GDEHW00502 and GDEGW00502 (analyzed in SDG 26253B). The RPD was 0.3% for field duplicate samples GDEHW04D02 and GDEGW04D02 (analyzed in SDG 26253B). Since these RPD's were within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

No MS / MSD analyses were performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 3.4% for TDS in field duplicate samples 580HW00202 and 580GW00202 (analyzed in SDG 26253B). The RPD was 1.2% for field duplicate samples GDEHW00502 and GDEGW00502 (analyzed in SDG 26253B). The RPD was 0.9% for field duplicate samples GDEHW04D02 and GDEGW04D02 (analyzed in SDG 26253B). Since the RPD's were within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26253 Level III, CLP Organics and Inorganics

SAMPLES: 097GW00102, 106GW00102, 106GW01D02, 580GW00102, 580GW00202, 580GW01D02, 586GW00102, 590GW00102, 590GW01D02, 596GW04D02, 598GW00102, GDEGW00402, GDEGW00502, GDEGW02D02, GDEGW03D02, GDEGW04D02, GDETW00402, GDETW00502, 586GW00102RE, GDEGW00402RE, GDEGW00502RE, GDEGW02D02RE, GDEGW03D02RE, GDEGW04D02RE

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/12/96 on instrument I for the following compounds:

bromomethane	33.7%
chloroethane	43.0%

Since these compounds were not detected in the associated samples, no action was required.

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 7/15/96 at 11:23 on instrument I for methylene chloride (41.5%). All positive and non-detect results for this compound in associated samples GDEGW04D02, GDEGW00502, 580GW00102, 580GW01D02, GDEGW02D03 and 580GW00202 were flagged as estimated (J) and (UJ).

#### IV.) Blanks:

Method Blanks:

Methylene chloride was detected at 2.0 ug/L in method blank VBLK1. The positive results for this compound in associated samples GDEGW03D02 and GDEGW00402, which were less than 10X the blank

amount, were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL.

Methylene chloride was detected at 4.0 ug/L in method blank VBLK2. All positive results for this compound in the all other samples in this SDG, less than 10X the blank amount, were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL.

#### Trip Blanks

Methylene chloride and trichloroethane were both detected at 1.0 ug/L in trip blank GDETW00402. The results for methylene chloride in the associated samples were previously flagged based on the method blanks. Trichloroethane was not detected in the associated samples. No further action was required.

Methylene chloride, acetone and 2-butanone were detected at 4.0 ug/L, 24.0 ug/L and 7.0 ug/L, respectively, in trip blank GDETW00502. The positive results for methylene chloride in the associated samples were previously flagged based on the method blanks. All positive results for acetone in associated samples 580GW00202, GDEGW00502 and GDEGW04D02, which were less than 10X the blank amount were flagged as undetected (U) with the quantitation limit being raised to the level of contamination in each sample. There were no positive results for 2-butanone in the associated samples, so no further action was taken.

#### TIC's:

All TIC criteria were met, so no action was taken.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

#### VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All criteria were met. No action was necessary.

#### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

#### VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG fraction. No action was necessary.

#### IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

#### X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

### *SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) for 4-methylphenol (32.0%) exceeded the 30% QC limit for the standards analyzed on 7/22/96 on instrument T. Since this compound was not detected in the associated samples, no action was necessary.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/23/96 on instrument V for 1,2-dichlorobenzene (31.0%) and hexachloroethane (31.7%). Since these compounds were not detected in the associated samples, no action was necessary.

Continuing Calibration:

The Percent Difference (%D) for hexachlorocyclopentadiene (31.6%) exceeded the 25% QC limit for the standard analyzed on 7/26/96 at 08:54 on instrument T. The results for this compound in associated samples GDEGW02D02 and GDEGW03D02, which were both non-detects, were flagged as estimated (UJ).

The Percent Difference (%D) for hexachlorocyclopentadiene (33.7%) exceeded the 25% QC limit for the standard analyzed on 7/27/96 at 20:04 on instrument T. The results for this compound in

associated samples GDEGW00402, 106GW00102, 106GW01D02 and 598GW00102, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/24/96 at 07:35 on instrument V for the following compounds:

hexachlorocyclopentadiene	31.5%
3-nitroaniline	32.5%
4-nitroaniline	40.1%
indeno(1,2,3-cd)pyrene	76.9%
dibenz(a,h)anthracene	60.7%
benzo(g,h,i)perylene	79.4%

The results for these compounds in associated samples GDEGW00502 and 586GW00102, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

Bis(2-ethylhexyl)phthalate and phenol were detected at 100 ug/L and 1.0 ug/L, respectively, in method blank SBLK2. All positive results for bis(2-ethylhexyl)phthalate in associated samples GDEGW00502, 586GW00102 and GDEGW04D02, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL. Phenol was not detected in the associated samples, so no further action was taken.

##### TIC's:

All TIC criteria were met, so no action was necessary.

#### V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2-fluorophenol (18%) was below the 21-110% QC limits for sample 106GW00102. Since only one acid surrogate was outside the QC limits, no action was taken.

The Percent Recovery (%R) of terphenyl-d14 (25%) was below the 33-141% QC limits for sample 598GW00102. Since only one base/neutral surrogate was outside the QC limits, no action was taken.

The Percent Recoveries (%R's) were below their respective QC limits for surrogates in sample GDEGW04D02:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
nitrobenzene-d5	23	35-114%
2-fluorobiphenyl	26	43-116%
terphenyl-d14	32	33-141%
2-fluorophenol	16	21-110%

All results for base/neutral compounds in this sample, which consisted entirely of non-detects, were

flagged as estimated (UJ).

The Surrogate Percent Recoveries (%R's) were below their respective QC limits for sample GDEGW00402:

<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
terphenyl-d14	31	33-141%
2-fluorophenol	6	21-100%
2,4,6-tribromophenol	2	10-123%

All results for acid compounds in this sample, which consisted entirely of non-detects, were rejected (R) since two of the %R's were less than 10%.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Several Percent Recoveries were outside the QC limits. Data validation based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

No MS / MSD analyses were performed in this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the associated field duplicate samples. No action was required.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 586GW00102, GDEGW00402, GDEGW00502, GDEGW02D2, GDEGW03D02 and GDEGW04D02 were considered by the validator to be of preferable data quality to the reanalyses based on better holding times. All acid fraction results for sample GDEGW00402 were rejected (R) due to very low (less than 10%) surrogate recoveries. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/18/96 at 23:48 on the primary column for alpha-BHC (31.0%), beta-BHC (36.0%), gamma-BHC (32.0%) and endrin (51.2%). All associated positive and non-detect sample results for these compounds were flagged as estimated (J) and (UJ). The associated samples were GDEGW00402, GDEGW02D02 and GDEGW03D02.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 7/18/96 at 23:48 on the secondary column for endrin (53.6%). All results for this compound in the associated samples were previously flagged, so no further action was required.

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 01:46 on the secondary column for endrin (27.8%). The non-detect results for this compound in associated samples GDEGW00502 and GDEGW04D02 were flagged as estimated (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standards analyzed on 7/16/96 at 17:28 on the secondary column for endrin (27.6%). The results for this compound in the associated samples were previously flagged, so no further action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

No MS / MSD analyses were performed for this fraction of the SDG. No action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was required.

IX.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the associated field duplicate samples. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB2	antimony	3.30 ug/L	16.5 ug/L
CCB3	copper	1.30 ug/L	6.50 ug/L
PBW	zinc	8.80 ug/L	44.0 ug/L
PBW	cyanide	2.75 ug/L	13.8 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water 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 in the second continuing calibration blank (CCB2):

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB2	barium	-0.40 ug/L	2.00 ug/L
CCB2	selenium	-3.00 ug/L	15.0 ug/L
CCB2	thallium	-4.30 ug/L	21.5 ug/L

All associated positive sample results less than 5X the absolute value of the negative blank result and all 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 detected in ICS Solution A at concentrations greater than the IDL:

silver	4 ug/L
thallium	6 ug/L

These analytes should not be present. Additionally, a negative result was observed for vanadium (-7 ug/L) in ICS Solution A at an absolute concentration greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) for calcium (19.4%), iron (16.5%) and manganese (12.7%) exceeded the 10% QC limit. All positive results for these analytes in all samples in this SDG were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample analyses were not performed in this SDG. No action was required.

VIII.) Matrix Spike Analysis (MS):

MS analyses were not performed in this SDG. No action was necessary.

IX.) Field Duplicates:

Sample 580GW00202, GDEGW00502 and GDEGW04D02 were analyzed in this SDG, while field duplicate samples 580HW00202, GDEHW00502 and GDEHW04D02 were analyzed in SDG 26253A. See SDG 26253A for Relative Percent Difference (RPD) tabulations. Since all RPD's were within the 30% QC limit for water samples, no action was required.

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:

All laboratory data were acceptable with qualifications.

*ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for tetrabutyltin (0.040) was below the 0.050 QC limit for the standard analyzed on 7/24/96 at 15:13 on instrument J. The results for this compound in all samples in this SDG were rejected (R).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for tetrabutyltin in the samples in this SDG were rejected (R) due to a low RRF in the continuing calibration. All other laboratory data were acceptable with qualifications.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 0.7% for sulfate in field duplicate samples 580GW00202 and 580HW00202 (analyzed in SDG 26253A). The RPD was 2.9% for field duplicate samples

GDEGW00502 and GDEHW00502 (analyzed in SDG 26253A). The RPD was 1.7% for field duplicate samples GDEGW04D02 and GDEHW04D02 (analyzed in SDG 26253A). Since the RPD's were within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 9.5% for chlorides in field duplicate samples 580GW00202 and 580HW00202 (analyzed in SDG 26253A). The RPD was 0.8% for field duplicate samples GDEGW00502 and GDEHW00502 (analyzed in SDG 26253A). The RPD was 0.3% for field duplicate samples GDEGW04D02 and GDEHW04D02 (analyzed in SDG 26253A). Since the RPD's were within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 3.4% for field duplicate samples 580GW00202 and 580HW00202 (analyzed in SDG 26253A). The RPD was 1.2% for field duplicate samples GDEGW00502 and GDEHW00502 (analyzed in SDG 26253A). The RPD was 0.9% for field duplicate samples GDEGW04D02 and GDEHW04D02 (analyzed in SDG 26253A). Since the RPD's were within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

# 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: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0091  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's  
  
SDG NO: 26304B (Level III)

### SAMPLE:

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
145GW00302	26339.07	Water	X

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26304B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLE: 145GW00302

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Several 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks. The highest associated blank concentrations were:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
DFBLK2	1234678-HpCDD	6.8	34
	OCDD	60.5	303
	1234678-HpCDF	6.4	32
	OCDF	6.4	32

Detections of these compounds in the associated sample below 5X the blank amounts were designated as EMPC (Estimated Maximum Possible Concentration).

Field Blanks:

No field blanks were analyzed. No action was taken.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD were analyzed. No action was taken.

One LCS sample was analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

No field duplicates were analyzed. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Laboratory "X" flags meaning "EMPC" were replaced with "EMPC" upon validation.

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0091  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III  
EPA METHOD: EPA SOW 3-90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organotins, Total Metals, Cyanide, Chloride, Sulfate, Total Dissolved Solids (TDS)  
SDG NUMBER: 26304 (Level III)

### SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals	Cyanide
566GW00102	26304.01	Water				X	
566GW01D02	26304.02	Water				X	
574GW00102	26339.02	Water		X		X	
574GW01D02	26339.03	Water		X		X	
574GW01D02RE	26339.03RE	Water		+			
574GW00202	26339.04	Water		X		X	
576GW00102	26317.03	Water	X	X		X	
576GW00202	26317.06	Water	X	X		X	
576GW02D02	26317.07	Water	X	X		X	
583GW00102	26317.11	Water	X			X	
583GW00202	26317.12	Water	X			X	
583GW02D02	26339.05	Water	X			X	
583GW00302	26339.06	Water	X			X	
599GW00102	26317.08	Water			X	X	X
599GW00102RE	26317.08RE	Water			+		

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals	Cyanide
GDEGW05D02	26317.01	Water	X	X	X	X	X
GDEGW05D02RE	26317.01RE	Water			+		
GDEGW00602	26317.02	Water	X	X	X	X	X
GDEGW00602RE	26317.02RE	Water			+		
GDEGW06D02	26339.01	Water	X	X	X	X	X
583TW00202	26317.13	Water	X				
583TW00302	26339.08	Water	X				
576GW00102MS	26317.04	Water	+	+		+	
576GW00102MD	26317.05	Water				+	
576GW00102MSD	26317.05	Water	+	+			
599GW00102MS	26317.09	Water			+	+	+
599GW00102MSD	26317.10	Water			+		+
599GW00102MD	26317.10	Water				+	

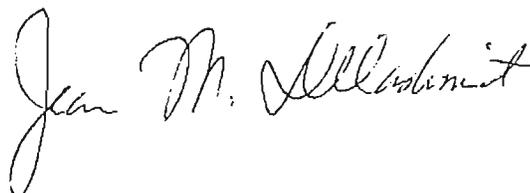
Client Sample #	Lab Sample #	Matrix	Chloride	Sulfate	TDS	Organotins
145GW00302	26339.07	Water	X	X	X	
566GW00102	26304.01	Water	X	X	X	
566GW01D02	26304.02	Water	X	X	X	
574GW00102	26339.02	Water	X	X	X	
574GW01D02	26339.03	Water	X	X	X	X
574GW00202	26339.04	Water	X	X	X	+
574GW00202RE	26339.04RE	Water				X
576GW00102	26317.03	Water	X	X	X	
583GW00102	26317.11	Water	X	X	X	
583GW00202	26317.12	Water	X	X	X	
583GW02D02	26339.05	Water	X	X	X	
583GW00302	26339.06	Water	X	X	X	
599GW00102	26317.08	Water	X	X	X	
GDEGW05D02	26317.01	Water	X	X	X	
GDEGW00602	26317.02	Water	X	X	X	
GDEGW06D02	26339.01	Water	X	X	X	
576GW00102MS	26317.04	Water	+	+	+	
576GW00102MSD	26317.05	Water	+	+	+	

+ = Non-billable Analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, T = TRIP BLANK

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

RELEASE SIGNATURE:



### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 26304, CLP Organics and Inorganics

SAMPLES: 145GW00302, 566GW00102, 566GW01D02, 574GW00102, 574GW01D02, 574GW01D02RE, 574GW00202, 574GW00202RE, 576GW00102, 576GW00202, 576GW02D02, 583GW00102, 583GW00202, 583GW02D02, 583GW00302, 599GW00102, 599GW00102RE, GDEGW05D02, GDEGW05D02RE, GDEGW00602, GDEGW00602RE, GDEGW06D02, 583TW00202, 583TW00302, 576GW00102MS, 576GW00102MSD, 576GW00102MD, 599GW00102MS, 599GW00102MSD, 599GW00102MD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 07/12/96 on instrument I for the following compounds:

bromomethane	33.7%
chloroethane	43.0%

Since these compounds were not detected in the associated samples, no action was taken.

The Percent Relative Standard Deviation (%RSD) of bromomethane was 39.8% which exceeded the 30% QC limit for the standards analyzed on 06/21/96 on instrument U. Since this compound was not detected in the associated samples, no action was taken.

##### Continuing Calibration:

The Percent Difference (%D) of vinyl acetate was 27.2% which exceeded the 25% QC limit for the standard analyzed on 07/18/96 at 11:45 on instrument I. All results for vinyl acetate in associated samples 576GW00102, 576GW00202, 576GW02D02, 583GW00102, 583GW00202, GDEGW00602 and GDEGW05D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 07/19/96 at 13:20 on instrument U for the following compounds:

vinyl acetate	82.8%
tetrachloroethene	26.3%

All results for these compounds in associated samples 583GW02D02, 583GW00302 and GDEGW06D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride (8 ug/L) and acetone (5 ug/L) were detected in method blank VBLK1. Methylene chloride and acetone were flagged using trip blank 583TW00202. No further action was taken.

Trip Blanks:

Methylene chloride (9 ug/L) and acetone (9 ug/L) were detected in trip blank 583TW00202. Detections of methylene chloride and acetone in associated samples less than 10X the blank amounts were flagged as undetected (U) with the quantitation limit being raised to the level of contamination in each sample. The associated samples were 576GW00102, 576GW00202, 576GW02D02, 583GW00102, 583GW00202, GDEGW00602 and GDEGW05D02.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All Percent Recovery criteria were met. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) was 14% for chlorobenzene in spiked samples 576GW00102MS and 576GW00102MSD, which exceeded the 13% QC limit. The non-detect result for this compound in unspiked sample 576GW00102 was flagged as estimated (UJ).

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of 4-methylphenol was 32.0%, which exceeded the 30% QC limit for the standards analyzed on 07/22/96 on instrument T. Since there were no positive detections of this compound in the associated samples, no action was necessary.

Continuing Calibration:

The Percent Difference (%D) of hexachlorocyclopentadiene was 41.6% which exceeded the 25% QC limit for the standard analyzed on 07/25/96 at 07:02 on instrument T. The non-detect results for this compound in the associated samples were flagged as estimated (UJ). The associated samples were GDEGW06D02, 574GW00102, 574GW01D02 and 574GW00202.

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in method blank SBLK1. Detections of this compound in all associated samples less than 10X the blank amounts were flagged as undetected (U) with the analytical results below the CRQL being replaced with the CRQL. The associated samples were GDEGW05D02, GDEGW00602, 576GW00102, 576GW00202 and 576GW02D02.

Bis(2-ethylhexyl)phthalate (2 ug/L) and benzoic acid (2 ug/L) were detected in method blank SBLK2. Detections of bis(2-ethylhexyl)phthalate in all associated samples less than 10X the blank amounts were flagged as undetected (U) with the analytical results below the CRQL being replaced with the CRQL. Detections of benzoic acid in all associated samples less than 5X the blank amounts were flagged as undetected (U) with the analytical results below the CRQL being replaced with the CRQL. The associated samples were GDEGW06D02, 574GW00102, 574GW01D02 and 574GW00202.

V.) Surrogate Recovery:

The Percent Recoveries (%R's) were below their respective QC limits for following samples:

Sample ID (QC Limits)	Phenol-d5 (10-94%)	2-Fluorophenol (21-100%)	2,4,6-Tribromophenol (10-123%)
576GW00102	2	0	0
574GW01D02	2	2	2

All results for acid fraction compounds in these samples, which consisted entirely of non-detects, were rejected (R) because the surrogate recoveries were less than 10%.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) were below their respective QC limits in spiked samples 576GW00102MS and 576GW00102MSD for the following compounds:

Compound	MS. %R	MSD. %R	QC Limits
phenol	2	2	12-110%
2-chlorophenol	2	2	27-123%
4-chloro-3-methylphenol	2	2	23-97%
4-nitrophenol	1	-	10-80%
pentachlorophenol	0	6	9-103%

The non-detect results for these compounds in unspiked sample 576GW00102 were previously rejected (R) due to low surrogate recoveries. No further action was required.

The Relative Percent Differences (RPD's) were exceeded their respective QC limits in spiked samples 576GW00102MS and 576GW00102MSD for the following compounds:

<u>Compound</u>	<u>%RPD</u>	<u>QC Limit</u>
4-nitrophenol	192	50%
pentachlorophenol	200	50%

The non-detect results for these two compounds in unspiked sample 576GW00102 were previously rejected based on the very low %R's of the surrogates and matrix spikes. No further action was taken.

VII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was taken.

VIII.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XI.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

The original analysis of sample 574GW01D02 was considered by the validator to be of preferable data quality to the reextraction because of its better holding time.

The non-detect results for acid fraction compounds in samples 576GW00102 and 574GW01D02 were rejected (R) because of surrogate and matrix spike recoveries of less than 10%. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met. No action was necessary.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) were outside their respective QC limits for the following compounds in spiked samples 599GW00102MS and 599GW00102MSD:

<u>Compound</u>	<u>MS, %R</u>	<u>MSD, %R</u>	<u>QC Limits</u>
4,4'-DDE	62	61	70-122%
endrin	171	-	42-145%

The positive result for endrin and non-detect result for 4,4'-DDE in unspiked sample 599GW00102 were flagged as estimated (J) and (UJ).

The Relative Percent Difference (RPD) of endrin was 39% in spiked samples 599GW00102MS and 599GW00102MSD, which exceeded the 21% QC limit. The positive result for this compound in unspiked sample 599GW00102 was flagged as estimated (J).

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met, so no action was necessary.

IX.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was taken.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

The original analyses of samples GDEGW05D02, GDEGW00602 and 599GW00102 were considered by the validator to be of preferable data quality to the re-extractions because of better holding times. All other laboratory data were acceptable with qualifications.

*ORGANOTIN*

I.) Holding Times:

The holding time from sample date to reextraction was 13 days for sample 574GW00202RE, which exceeded the 7 day QC limit. All results for this sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was taken.

Continuing Calibration:

The Relative Response Factor (RRF) of tetrabutyltin was 0.044, which was below the 0.050 QC limit for

the continuing calibration run on 07/28/96 at 15:51 on instrument J. The results for this compound in associated samples, which consisted were both non-detects, were rejected (R). The associated samples were 574GW01D02 and 574GW00202.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 08/01/96 at 15:59 on instrument J for the following compounds:

tetrabutyltin	28.9%
tributyltin	30.0%
monobutyltin	26.8%

The results for these compounds in associated sample 574GW00202RE, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

V.) Surrogate Recovery:

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

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses for this fraction. No action was taken.

VII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was taken.

VIII.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XI.) System Performance:

All System Performance criteria were met, so no action was taken.

XII.) Overall Assessment of Data/General:

The re-extraction sample of 574GW00202 was considered by the validator to be of preferable data quality to the original analysis and was selected for validation because of fewer rejected data points. The non-detected result for tetrabutyltin in sample 574GW01D02 was rejected (R) due to a very low RRF in the continuing calibration. All other laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
ICB1	antimony	2.70 ug/L	13.5 ug/L
CCB1	arsenic	4.10 ug/L	20.5 ug/L
PBW1	barium	2.61 ug/L	13.1 ug/L
PBW1	calcium	22.3 ug/L	111.5 ug/L
CCB1	chromium	1.50 ug/L	7.50 ug/L
PBW1	copper	1.75 ug/L	8.75 ug/L
CCB1	nickel	0.90 ug/L	4.50 ug/L
PBW2	tin	4.69 ug/L	23.5 ug/L
PBW1	zinc	9.94 ug/L	49.7 ug/L
CCB2	cyanide	5.30 ug/L	26.5 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,  
PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water 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.
CCB6	calcium	-23.7 ug/L	119 ug/L
CCB7	nickel	-0.90 ug/L	4.50 ug/L
CCB4	silver	-1.90 ug/L	9.50 ug/L
ICB2	selenium	-4.20 ug/L	21.0 ug/L
PBW1	thallium	-6.04 ug/L	30.2 ug/L
CCB4	vanadium	-0.60 ug/L	3.00 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,  
 PBW = Preparation Blank (Water)

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.

Antimony (7 ug/L) was detected in ICS Solution A at a concentration greater than the IDL. This analyte should not be present. Magnesium was detected at a concentration comparable to that of ICS Solution A in associated samples GDEGW05D02 and GDEGW06D02. Since antimony was not detected in these two samples, no action was taken.

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

barium	-3 ug/L
lead	-5 ug/L

Magnesium was detected at concentrations comparable to those of ICS Solution A in associated samples GDEGW05D02 and GDEGW06D02. The non-detect results for lead in these two samples were flagged as estimated (UJ). No further action was taken for the positive results for barium in these two samples.

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All Duplicate Sample criteria were met, so no action was taken.

VIII.) Matrix Spike Recoveries:

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

IX.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was taken.

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:

All laboratory data were acceptable with qualifications.

*WET CHEMISTRY ANALYSES*

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

Chloride was not detected in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

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

VII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

Sulfate was not detected in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

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

VII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive results for TDS in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

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

VII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

# 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: Charleston Naval Base, Zone E  
PROJECT NUMBER: 8500.014  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NO: 26356A (Level IV)  
26356B (Level III)

### SAMPLES:

#### 26356A (Level IV)

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>PCDF</u>
145HW00202	26369.01	Water	X

#### 26356B (Level III)

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>PCDF</u>
145GW00102	26356.07	Water	X
145EW00102	26356.09	Water	X
145FW00102	26356.10	Water	X
145DW00102	26356.08	Water	X
145GW00202	26368.03	Water	X
145GW01D02	26356.11	Water	X
145GW01D02MS	26356.12	Water	+
145GW01D02MSD	26356.13	Water	+

D = DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,  
RE = REANALYZED

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE: 

## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26356A/B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 145HW00202, 145GW00102, 145EW00102, 145FW00102, 145DW00102,  
145GW00202, 145GW01D02, 145GW01D02MS, 145GW01D02MSD

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

Several 2,3,7,8-substituted PCDD's and PCDF's were detected in the method blank at the following concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
DFBLK2	1234678-HpCDD	6.8	34
	OCDD	60.5	303
	1234678-HpCDF	6.4	32
	OCDF	6.4	32

Detections of the above compounds in all associated samples below 5X the blank amounts were designated as EMPC (Estimated Maximum Possible Concentration).

Field Blanks:

Deionized water blank 145DW00102, equipment rinsate blank 145EW00102 and field blank 145FW00102 collected on 7/18/96 were analyzed. Several 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
145DW00102	1234678-HpCDD	42.7	214
	OCDD	419	2100
	1234678-HpCDF	14.4	72
	OCDF	25.1	126

Detections of the above compound in all associated samples below 5X the blank amounts were designated as EMPC (Estimated Maximum Possible Concentration).

V.) Internal Standards Performance:

Internal Standard Recoveries (%R's) of 13C-1234678HpCDF for samples 145EW00102 and

145FW00102 were 38.6% and 38.7%, respectively, which were below the 40-135% QC limits. Since there were no associated positive results for these two samples, no action was taken.

VI.) Spike/Spike Duplicates:

One set of MS/MSD samples were analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

Field sample duplicates 145GW00202 and 145HW00202 were analyzed. The positive sample results were the following:

Analyte	145GW00202, pg/L	145HW00202, pg/L
1234678-HpCDD	7.93 *	8.82 *
OCDD	111 *	173 *
1234678-HpCDF	5.43 *	10.2 *
OCDF	10.1 *	14.7 *

\* = EMPC

Since all above positive sample results were flagged as EMPC due to the blank contamination, no RPD's were calculable and no action was necessary.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

OCDD was detected at 419 pg/L in the DI blank 145DW00102, which is unusually high. Since Level III validation was assigned to this sample and no raw data was submitted, no raw data check was performed and this result was used to flag all the associated results.

All data were acceptable with qualifications. Laboratory "X" flags meaning "EMPC" were replaced with "EMPC" upon validation.

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0095  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals and Cyanide, Organotin, Chloride, Sulfate, Total Dissolved Solids (TDS)  
SDG NUMBER: 26356 (Levels III and IV)

### SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
083GW00102	26368.06	Water		X		X*
083GW00202	26356.06	Water		X		X*
100GW00102	26368.04	Water				X*
102GW00102	26368.05	Water		X		X*
172GW00102	26368.07	Water	X	X		X*
172GW02D02	26368.08	Water	X	+		X*
172GW02D02RE	26368.08RE	Water		X		
574GW00302	26356.05	Water		X		X*
GDEGW00702	26356.01	Water	X	+	X	X
GDEGW00702RE	26356.01RE	Water		X		
GDEGW00802	26356.03	Water	X	+	X	X
GDEGW00802RE	26356.03RE	Water		X		
GDEGW00902	26368.01	Water	X	X	X	X
GDEGW07D02	26356.02	Water	X	X	X	X
GDEGW07D02RE	26356.02RE	Water			+	
GDEGW08D02	26356.04	Water	X	X	X	X
GDEGW09D02	26368.02	Water	X	X	X	X
145DW00102	26356.08	Water	X	+	X	X
145DW00102RE	26356.08RE	Water		X		

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
145EW00102	26356.09	Water	X	X	X	X
145FW00102	26356.10	Water	X	X	X	X
172TW02D02	26368.09	Water	X			
GDETW00702	26356.14	Water	X			

Client Sample #	Lab Sample #	Matrix	Organotin	Chloride	Sulfate	TDS
083GW00102	26368.06	Water	X	X	X	X
083GW00102RE	26368.06RE	Water	+			
083GW00202	26356.06	Water	X	X	X	X
100GW00102	26368.04	Water	X	X	X	X
102GW00102	26368.05	Water	X	X	X	X
102GW00102RE	26368.05RE	Water	+			
145GW00102	26356.07	Water		X	X	X
145GW00202	26368.03	Water		X	X	X
145HW00202	26369.01	Water		X <sup>IV</sup>	X <sup>IV</sup>	X <sup>IV</sup>
145GW01D02	26356.11	Water		X	X	X
172GW00102	26368.07	Water		X	X	X
172GW02D02	26368.08	Water		X	X	X
574GW00302	26356.05	Water	X	X	X	X
574GW00302RE	26356.05RE	Water	+			
GDEGW00702	26356.01	Water		X	X	X
GDEGW00802	26356.03	Water		X	X	X
GDEGW00902	26368.01	Water		X	X	X
GDEGW07D02	26356.02	Water		X	X	X
GDEGW08D02	26356.04	Water		X	X	X
GDEGW09D02	26368.02	Water		X	X	X
145DW00102	26356.08	Water	+	X	X	X
145DW00102RE	26356.08RE	Water	X			
145EW00102	26356.09	Water	+	X	X	X
145EW00102RE	26356.09RE	Water	X			
145FW00102	26356.10	Water	+	X	X	X
145FW00102RE	26356.10RE	Water	X			
145GW01D02MS	26356.11MS	Water		+		
145GW01D02MSD	26356.11MSD	Water		+		

X\* = Total Metals only, no cyanide analysis, X<sup>IV</sup> = QC Level IV  
+ = Non-billable Analysis or Quality Control sample

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK,  
H = FIELD DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,  
RE = REANALYSIS

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

RELEASE SIGNATURE: 

### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 26356 Level III, CLP Organics and Inorganics

SAMPLES: 083GW00102, 083GW00102RE, 083GW00202, 100GW00102, 102GW00102, 102GW00102RE, 145DW00102, 145DW00102RE, 145EW00102, 145EW00102RE, 145FW00102, 145FW00102RE, 145GW00202, 145HW00202, 145GW01D02, 172GW00102, 172GW02D02, 172GW02D02RE, 172TW02D02, 574GW00302, 574GW00302RE, GDEGW00702, GDEGW00702RE, GDEGW00802, GDEGW00802RE, GDEGW00902, GDEGW07D02, GDEGW07D02RE, GDEGW08D02, GDEGW09D02, GDETW00702, 145GW01D02MS, 145GW01D02MSD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for vinyl acetate (0.044) and 2-chloroethyl vinyl ether (0.040) were below the 0.050 QC limit for the standards analyzed on 7/08/96 on instrument R. The non-detect results for these compounds in all samples and blanks in this SDG were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/08/96 on instrument R for the following compounds:

bromomethane	32.4%
acetone	35.0%
2-chloroethyl vinyl ether	41.8%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected based on a low RRF in this calibration. Since the other compounds were not detected in the SDG samples, no further action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standard analyzed on 7/23/96 at 14:14 on instrument R for vinyl acetate (0.024) and 2-chloroethyl vinyl ether (0.021). The

results for these compounds in the associated samples were previously rejected based on the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/23/96 at 14:14 on instrument R for the following compounds:

vinyl acetate	45.5%
2-chloroethyl vinyl ether	47.5%
4-methyl-2-pentanone	25.9%
2-hexanone	26.6%

The results for vinyl acetate and 2-chloroethyl vinyl ether in the associated samples were previously rejected. All results for the other compounds in associated samples GDEGW00902, GDEGW09D02, 172GW02D02, GDEGW00702, GDEGW07D02, GDEGW00802 and GDEGW08D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factors (RRF's) for vinyl acetate (0.019) and 2-chloroethyl vinyl ether (0.029) were below the 0.050 QC limit for the standards analyzed on 7/24/96 at 10:30 on instrument R. The non-detect results for these compounds in the associated sample were previously rejected based on the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/24/96 at 10:30 on instrument R for the following compounds:

chloroethane	28.8%
vinyl acetate	56.8%
2-chloroethyl vinyl ether	27.5%

The non-detect result for chloroethane in associated sample 172GW00102 was flagged as estimated (UJ). The results for the other compounds in the associated sample were previously rejected. No further action was taken.

#### IV.) Blanks:

##### Method Blanks:

Methylene chloride was detected at 1.0 ug/L in method blank VBLK1 and at 2.0 ug/L in method blank VBLK2. The results for this compound in the associated samples were qualified based on the trip blanks. No further action was required.

##### Deionized Water Blank:

Methylene chloride, acetone, bromodichloromethane and chloroform were detected at 2.0 ug/L, 8.0 ug/L, 3.0 ug/L and 28.0 ug/L, respectively, in deionized water blank 145DW00102. Methylene chloride and acetone were qualified based on the trip blanks. The other compounds were not detected in the associated samples, so no further action was required.

Equipment Rinsate Blank:

Methylene chloride, bromodichloromethane and chloroform were detected at 2.0 ug/L, 3.0 ug/L and 30.0 ug/L, respectively, in equipment rinsate blank 145EW00102. The results for methylene chloride were qualified based on the trip blanks. The other compounds were not detected in the associated samples, so no further action was required.

Field Blank:

Methylene chloride, acetone, bromodichloromethane and chloroform were detected at 4.0 ug/L, 5.0 ug/L, 3.0 ug/L and 27.0 ug/L, respectively, in field blank 145FW00102. The results for methylene chloride and acetone were flagged based on the trip blanks. There were no positive results for the other compounds, so no further action was required.

Trip Blanks:

Methylene chloride and acetone were detected at 3.0 ug/L and 2.0 ug/L, respectively, in trip blank 172TW02D02. All positive results for these compounds in associated samples 172GW00102, 172GW02D02, GDEGW00902 and GDEGW09D02, which were less than 10X the blank amounts, were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL.

Methylene chloride and acetone were detected at 4.0 ug/L and 2.0 ug/L, respectively, in trip blank GDETW00702. All positive results for these compounds in associated samples GDEGW00702, GDEGW00802, GDEGW07D02 and GDEGW08D02, which were less than 10X the blank amounts, were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS recoveries was not required, so no action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for vinyl acetate and 2-chloroethyl vinyl ether in the samples and blanks in this SDG were rejected due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

The holding times from sample date to re-extraction of samples 172GW02D02RE, GDEGW00702RE and GDEGW00802RE and blank 145DW00102RE were 21 to 22 days, which exceeded the 14-day QC limit. All positive and non-detect results for the three samples were flagged as estimated (J) and (UJ). No action was required for the deionized water blank.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 7/22/96 on instrument T for 4-methylphenol (32.0%). There were no positive results for this compound in the associated samples, so no action was required.

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 7/26/96 at 08:54 on instrument T for hexachlorocyclopentadiene (31.6%). The non-detect result for this

compound in associated sample GDEGW08D02 was flagged as estimated (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 7/27/96 at 20:04 on instrument T for hexachlorocyclopentadiene (33.7%). The non-detect result for this compound in associated sample GDEGW07D02 was flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/29/96 at 11:48 on instrument T for the following compounds:

hexachlorocyclopentadiene	30.7%
2,4-dinitrophenol	44.8%

The results for these compounds in associated samples 083GW00202 and 574GW00302, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/26/96 at 07:41 on instrument V for the following compounds:

1,2-dichlorobenzene	28.1%
naphthalene	25.2%
2,4-dinitrophenol	26.5%
3,3'-dichlorobenzidine	27.5%

The results for these compounds in associated samples GDEGW00902, GDEGW09D02, 102GW00102 and 083GW00102, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/29/96 at 09:01 on instrument V for the following compounds:

1,2-dichlorobenzene	36.5%
4-methylphenol	28.5%
hexachloroethane	32.4%
benzoic acid	38.8%
naphthalene	26.0%
2,4-dinitrophenol	56.0%
4,6-dinitro-2-methylphenol	36.5%
3,3'-dichlorobenzidine	50.0%
indeno(1,2,3-cd)pyrene	26.8%

All positive and non-detect results for these compounds in associated sample 172GW00102 were flagged as estimated (J) and (UJ).

~~The Relative Response Factor for benzidine was 0.003, which was below the 0.050 QC limit for the standard analyzed on 7/31/96 at 13:20 on instrument V. The non-detect result for this compound in associated samples 172GW00202RE, GDEGW00102RE and GDEGW00802RE and blank 143DW00102RE were rejected (R).~~

~~The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/31/96 at~~

13/20 on instrument V for the following compounds:

indeno (1,2,3-cd) pyrene	26.8%
dibenz(a,h)anthracene	30.1%
benzo(g,h,i)perylene	28.8%
benzidine	63.7%

The results for these compounds in associated samples 172GW02D02RE, GDEGW00702RE and GDEGW00802RE, which consisted entirely of non-detects, were flagged as estimated (E).

#### IV.) Blanks:

##### Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 1.0 ug/L in method blank SBLK1. All positive results for bis(2-ethylhexyl)phthalate in associated samples GDEGW08D02, GDEGW07D02, GDEGW00802, 083GW00202 and 574GW00302, which were less than 10X the blank amount, were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL.

##### Deionized Water Blank:

There were no positive detections in the reanalysis of the deionized water blank. No action was taken.

##### Equipment Rinsate Blanks:

Bis(2-ethylhexyl)phthalate was detected at 3.0 ug/L in equipment rinsate blank 145EW00102. The associated sample results for this compound were flagged based on the method blanks, so no further action was required.

#### V.) Surrogate Recoveries:

The Surrogate Percent Recoveries (%R's) were outside the QC limits for the following samples:

<u>Client Sample #</u>	<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
GDEGW00802	terphenyl-d14	32	33-141%
	2-fluorophenol	12	21-100%
	2,4,6-tribromophenol	5	10-123%
083GW00202	terphenyl-d14	23	33-141%
172GW02D02	2-fluorophenol	3	21-100%
	2,4,6-tribromophenol	9	10-123%
GDEGW00702	2-fluorophenol	4	21-100%
	2,4,6-tribromophenol	6	10-123%

<u>Client Sample #</u>	<u>Surrogate</u>	<u>%R</u>	<u>QC Limits</u>
145DW00102	phenol-d5	2	10-94%
	2-fluorophenol	1	21-100%
	2,4,6-tribromophenol	4	10-123%

No action was required for sample 083GW00202 since only one surrogate was outside its QC limits. The reanalyses of the blank and the other three samples yielded surrogate recoveries within the QC limits. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples designated in this fraction. No action was required.

IX.) Internal Standards Performance (ISTD's):

The internal standard area count for perylene-d12 in sample GDEGW00702 (44.4%) was below the 50-200% QC limits. The reanalysis of this sample yielded ISTD results within the QC limits. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The reanalyses of samples 172GW02D02, GDEGW00702 and GDEGW00802 and blank 145DW00102 were considered by the validator to be of preferable data quality to the original analyses due to improved

surrogate recoveries. Sample GDEGW00702 also had improved internal standard performance in the reanalysis. These reanalyses were selected for validation. Benzidine was rejected (R) in all four reanalyses due to a low RRF. All other laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/27/96 at 22:41 for the following compounds:

<u>Compound</u>	<u>%D, Column 1</u>	<u>%D, Column 2</u>
alpha-BHC	27.0	29.0
beta-BHC	32.0	-
gamma-BHC	28.0	29.0
endrin	30.8	28.8

The results for these compounds in associated samples GDEGW00902 and GDEGW09D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

III.) Calibration:

Initial Calibration:

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

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 7/28/96 at 09:39 on the secondary column for endrin aldehyde (60.4%). The results for this compound in associated samples GDEGW00702, GDEGW07D02, GDEGW00802 and GDEGW08D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blanks:

There were no positive detections in the associated field blanks. No action was required.

V.) Surrogate Recoveries:

The Surrogate Percent Recoveries (%R's) were outside the 30-150% QC limits for the following samples:

Client <u>Sample#</u>	TCX, %R <u>Column 1</u>	TCX, %R <u>Column 2</u>	DCB, %R <u>Column 1</u>	DCB, %R <u>Column 2</u>
GDEGW07D02	14	16	23	19
GDEGW08D02	-	-	-	1189

All positive and non-detect results for sample GDEGW07D02 were flagged as estimated (J) and (UJ). Since there were no positive results for sample GDEGW08D02, no further action was taken.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD analyses for this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was taken.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

The original analysis of sample GDEGW07D02 was considered by the validator to be of preferable data quality to the reanalysis because of its better holding time. All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ID</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB2	antimony	5.90 ug/L	29.5 ug/L
145FW00102	barium	47.4 ug/L	237 ug/L
145DW00102	beryllium	0.45 ug/L	2.25 ug/L
145FW00102	calcium	437 ug/L	2180 ug/L
145FW00102	cobalt	1.60 ug/L	8.00 ug/L
145EW00102	iron	23.3 ug/L	116 ug/L
PBW	lead	2.90 ug/L	14.5 ug/L
145DW00102	magnesium	65.6 ug/L	328 ug/L
145EW00102	manganese	2.40 ug/L	12.0 ug/L
145FW00102	mercury	0.18 ug/L	0.90 ug/L
145EW00102	nickel	0.88 ug/L	4.40 ug/L
145DW00102	potassium	2550 ug/L	12800 ug/L
CCB2	silver	2.90 ug/L	14.5 ug/L
145DW00102	sodium	22900 ug/L	114000 ug/L
145EW00102	thallium	4.00 ug/L	20.0 ug/L
PBW	tin	6.10 ug/L	30.5 ug/L
145EW00102	vanadium	2.80 ug/L	14.0 ug/L
145DW00102	zinc	10.2 ug/L	51.0 ug/L
CCB2	cyanide	5.30 ug/L	26.5 ug/L

CCB = Continuing Calibration Blank, DW = Deionized Rinsate Blank,  
EW = Equipment Rinsate Blank, FW = Field Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amounts (Action level, ug/L for water samples) for which the contaminated blank was an associated calibration, preparation, deionized water, equipment rinsate or field blank were flagged as undetected (U).

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

<u>Blank</u> <u>Type/ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
PBW	arsenic	-2.60 ug/L	13.0 ug/L
PBW	chromium	-0.82 ug/L	4.10 ug/L
CCB3	copper	-1.30 ug/L	6.50 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank result and all 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 detected in ICS Solution A at concentrations greater than the IDL:

arsenic	7 ug/L
barium	4 ug/L
beryllium	1 ug/L
cadmium	1 ug/L
vanadium	3 ug/L

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

Negative results were observed for cobalt (-1 ug/L), copper (-3 ug/L), lead (-2 ug/L) and thallium (-5 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There were no Duplicate Sample Analyses in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spikes analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. 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:

All laboratory data were acceptable with qualifications.

*ORGANOTIN*

I.) Holding Times:

The reextractions of blanks 145EW00102, 145FW00102 and 145DW00102 were performed 22 days after the sampling date, which exceeded the 14-day QC limit. No action was required since these were field blanks.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for tetrabutyltin (0.044) was below the 0.050 QC limit for the standard analyzed on 7/28/96 at 15:51 on instrument J. The results for this compound in associated samples 574GW00302 and 083GW00202 and blanks 145DW00102 and 145EW00102, which consisted entirely of non-detects, were rejected (R).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blanks:

There were no positive detections in the field blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of tripropyltin were below the 10-160% QC limits for blanks 145DW00102, 145EW00102 and 145FW00102. The reanalyses of these samples yielded %R's that were low, but within the QC limits. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The original analyses of samples 083GW00102, 102GW00102, 574GW00302 were considered by the validator to be of preferable data quality to the reanalyses because of their better holding times. The reanalyses of blanks 145DW00102, 145EW00102 and 145FW00102 were considered by the validator to be of preferable data quality to the original analyses because of improved surrogate recoveries. The preferable sets of data were selected for validation.

The non-detect results for tetrabutyltin in samples 574GW00302 and 083GW00202 were rejected (R) due to low a RRF in the continuing calibration. All other laboratory data were acceptable with qualifications.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks for this SDG. No action was required.

Field Blanks:

Sulfate was detected at 2.2 ug/L in deionized water blank 145DW00102 and in equipment rinsate blank 145EW00102, and at 2.3 ug/L in field blank 145FW00102. All positive detections of sulfate in the samples in this SDG, less than 5X the highest blank amount, were flagged as undetected (U) with the detection limits being raised to the level of contamination in each sample.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 145GW00202 and 145HW00202 was not calculable. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water Blank:

Chloride was detected at 20.2 ug/L in deionized water blank 145DW00102. All positive results for chlorides in the samples in this SDG, less than 5X the blank amount, were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

Equipment Rinsate Blank:

Chloride was detected at 19.6 ug/L in equipment rinsate blank 145EW00102. All positive results for chlorides in the associated samples were previously flagged based on the deionized water blank. No further action was required.

Field Blank:

Chloride was detected at 20.1 ug/L in field blank 145FW00102. All positive results for chlorides in the associated samples were previously flagged based on the deionized water blank. No further action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 145GW00202 and 145HW00202 was not calculable. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water Blank:

TDS was detected at 45 mg/L in deionized water blank 145DW00102. All positive results for TDS in the samples in this SDG, less than 5X the blank amount, were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

Equipment Rinsate Blank:

TDS was detected at 35 mg/L in equipment rinsate blank 145EW00102. The results for TDS in the associated samples were flagged based on the deionized water blank. No further action was required.

Field Blank:

TDS was detected at 34 mg/L in field blank 145FW00102. The results for TDS in the associated samples were previously flagged based on the deionized water blank. No further action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The calculable Relative Percent Difference (RPD) was 66.7% for field duplicate samples 145GW00202 and 145HW00202, which exceeded the 30% QC limit for water samples. The results for TDS in both samples were flagged as estimated (J).

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

# 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: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0101  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's

SDG NO: 26382A (Level IV)  
26382B (Level III)

### SAMPLES:

#### 26382A (Level IV):

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
084HW00202	26383.01	Water	X
573HW00102	26383.02	Water	X

#### 26382B (Level III):

Client	Lab		PCDD/ PCDF
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	
084GW00102	26382.05	Water	X
084GW00202	26382.06	Water	X

D = DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,  
RE = REANALYZED

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE: 

## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26382A/B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 084HW00202, 573HW00102, 084GW00102, 084GW00202

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks

Method Blanks:

The following 2,3,7,8-substituted PCDD's were detected in method blanks at the concentrations listed:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
DFBLK	1234678-HpCDD	6.4	32
	OCDD	46.8	234

Detections of the above compounds in all associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

The detection limit of OCDF for method blank DFBLK was 12.3 pg/L, which was about 3X higher than normal method detection limit (< 4.0 pg/L), detections of OCDF in all associated samples below 15 pg/L were flagged as EMPC.

Field Blanks:

No field blanks were analyzed in this SDG. No action was taken.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

MS/MSD's were not analyzed in this SDG. No action was taken.

One LCS sample was analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

Field duplicate samples 084GW00202 and 084HW00202 were analyzed. There were no positive

sample results after blank qualification, so no RPD's were calculable.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable with qualifications. Laboratory "X" flags meaning "EMPC" were replaced with "EMPC" upon validation.

# VALIDATA

Chemical Services, Inc.

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## DATA VALIDATION SUMMARY REPORT

COMPANY: Ensafe/Allen & Hoshall  
SITE NAME: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0101  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3-90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals and Cyanide, Organotin, Chloride, Sulfate, Total Dissolved Solids (TDS)  
SDG NUMBERS: 26382A (Appendix IX, Level IV)  
26382B (Level III)

### SAMPLES:

#### SDG 26382A (Level IV):

Client	Lab	Total	Chloride	Sulfate	TDS
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Metals</u>		
084HW00202**	26383.01	Water	X	X	X
573HW00102**	26383.02	Water	X	X	X

\*\* = Field duplicates were associated with samples 084GW00202 and 573GW00102, analyzed in SDG 26382B.

HW = FIELD DUPLICATE

#### SDG 26382B (Level III):

Client	Lab	Volatile	Semi-	Pesticides/	Metals/
<u>Sample #</u>	<u>Sample #</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Cyanide</u>
084GW00102	26382.05	Water			X*
084GW00202**	26382.05	Water			X*

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Metals/ Cyanide
172GW00202	26399.05	Water	X	X		X*
570GW00102	26399.06	Water	X	X		X*
570GW00202	26399.07	Water	X	X		X*
570GW00302	26382.03	Water	X	X		X*
570GW02D02	26399.08	Water	X	X		X*
570GW03D02	26382.04	Water	X	X		X*
572GW00102	26399.09	Water	X	X		X*
572GW00202	26399.10	Water	X	X		X*
573GW00102**	26382.07	Water				X*
573GW01D02	26399.11	Water				X*
GDEGW01002	26382.01	Water	X	X	X	X
GDEGW01102	26399.01	Water	X	X	X	X
GDEGW01302	26399.03	Water	X	X	X	X
GDEGW10D02	26382.02	Water	X	X	X	X
GDEGW11D02	26399.02	Water	X	X	X	X
GDEGW13D02	26399.04	Water	X	X	X	X
GDETW01002	26382.08	Water	X			
GDETW01302	26399.12	Water	X			

Client Sample #	Lab Sample #	Matrix	Organotin	Chloride	Sulfate	TDS
084GW00102	26382.05	Water		X	X	X
084GW00202**	26382.05	Water		X	X	X
172GW00202	26399.05	Water	X	X	X	X
172GW00202RE	26399.05RE	Water	+			
570GW00102	26399.06	Water		X	X	X
570GW00202	26399.07	Water		X	X	X
570GW00302	26382.03	Water		X	X	X
570GW02D02	26399.08	Water		X	X	X
570GW03D02	26382.04	Water		X	X	X
572GW00102	26399.09	Water		X	X	X
572GW00202	26399.10	Water		X	X	X
573GW00102**	26382.07	Water		X	X	X
573GW01D02	26399.11	Water		X	X	X
GDEGW01002	26382.01	Water		X	X	X
GDEGW01102	26399.01	Water		X	X	X
GDEGW01302	26399.03	Water		X	X	X
GDEGW10D02	26382.02	Water		X	X	X
GDEGW11D02	26399.02	Water		X	X	X
GDEGW13D02	26399.04	Water		X	X	X

X\* = Analysis for total metals only

\*\* = Samples were associated with field duplicates samples 084HW00202 and 573HW00102, analyzed in SDG 26382A.

T = TRIP BLANK, RE = REANALYSIS

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

RELEASE SIGNATURE: 

### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc - 26382A Appendix IX, CLP Organic and Inorganics

SAMPLES: 084HW00202, 573HW00102

### *TOTAL METALS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
PBW1B	antimony	2.56 ug/L	12.8 ug/L
CCB1	barium	0.40 ug/L	2.00 ug/L
PBW1B	copper	2.39 ug/L	12.0 ug/L
CCB1	silver	1.80 ug/L	9.00 ug/L
PBW1B	zinc	15.4 ug/L	77.0 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level) 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.
CCB3	calcium	-36.3 ug/L	182 ug/L
CCB2	copper	-1.60 ug/L	8.00 ug/L
CCB2	silver	-2.50 ug/L	12.5 ug/L

CCB = Continuing Calibration Blank

All associated positive sample results greater than 5X the absolute value of the negative blank results. No action was required. All associated non-detects were flagged as estimated (UJ).

IV.) ICP Interference Check Sample Results:

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

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

arsenic	9 ug/L
cadmium	2 ug/L
chromium	2 ug/L
lead	3 ug/L
selenium	3 ug/L
thallium	8 ug/L

These analytes should not be present. Since calcium, iron, magnesium nor iron was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

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

barium	-2 ug/L
copper	-2 ug/L
nickel	-1 ug/L

Since calcium, iron, magnesium nor iron was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

No MS sample was analyzed in this SDG. No action was taken.

IX.) Field Duplicates:

Samples 084HW00202 and 573HW00102 were analyzed in this SDG, while corresponding samples 084GW00202 and 573GW00102 were analyzed in SDG 26382B. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>084HW00202</u>	<u>084GW00202</u>	<u>RPD</u>
arsenic	44.2 ug/L	44.7 ug/L	1.1%
calcium	16900 ug/L	16400 ug/L	3.0%
iron	2400 ug/L	2440 ug/L	1.7%
magnesium	3820 ug/L	3760 ug/L	1.6%
manganese	227 ug/L	221 ug/L	2.7%
sodium	37300 ug/L	36900 ug/L	1.1%

<u>Analyte</u>	<u>573HW00102</u>	<u>573GW00102</u>	<u>RPD</u>
barium	29.6 ug/L	29.4 ug/L	0.7%
calcium	84500 ug/L	83000 ug/L	1.8%
iron	3890 ug/L	3830 ug/L	1.6%
magnesium	16300 ug/L	16100 ug/L	1.2%
manganese	283 ug/L	279 ug/L	0.4%
potassium	10000 ug/L	9720 ug/L	2.8%
sodium	26700 ug/L	26000 ug/L	2.7%

Since all RPD's for these analytes were within the 30% QC limit, no action was required.

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:

All laboratory data were acceptable with qualifications.

*WET CHEMISTRY ANALYSES*

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blank:

There was no positive chloride detection in the method blank. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this fraction. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) Field Duplicates:

Samples 084HW00202 and 573HW00102 were analyzed in this SDG, while samples 084GW00202 and 573GW00102 were analyzed in SDG 26382B. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u> chloride	<u>084HW00202</u> 7.7 ug/L	<u>084GW00202</u> 7.7 ug/L	<u>RPD</u> 0%
<u>Analyte</u> chloride	<u>573HW00102</u> 18.3 ug/L	<u>573GW00102</u> 17.6 ug/L	<u>RPD</u> 3.9%

Since the RPD's for chloride were within the 30% QC limit, no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blank:

There was no sulfate detection in the method blank. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed for this fraction. No action was required.

VII.) Field Duplicates:

Samples 084HW00202 and 573HW00102 were analyzed in this SDG, while samples 084GW00202 and 573GW00102 were analyzed in SDG 26382B. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>084HW00202</u>	<u>084GW00202</u>	<u>RPD</u>
sulfate	12.4 ug/L	11.9 ug/L	4.1%
<u>Analyte</u>	<u>573HW00102</u>	<u>573GW00102</u>	<u>RPD</u>
sulfate	60.5 ug/L	60.2 ug/L	0.5%

Since the RPD's for sulfate were within the 30% QC limit, no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blank:

There was no TDS detection in the method blank. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not required for TDS analysis. No action was taken.

VII.) Field Duplicates:

Samples 084HW00202 and 573HW00102 were analyzed in this SDG, while samples 084GW00202 and 573GW00102 were analyzed in SDG 26382B. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>084HW00202</u>	<u>084GW00202</u>	<u>RPD</u>
TDS	190 ug/L	198 ug/L	4.1%
<u>Analyte</u>	<u>573HW00102</u>	<u>573GW00102</u>	<u>RPD</u>
TDS	450 ug/L	288 ug/L	43.9%

Since the RPD's for TDS were within the 30% QC limit, no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26382B Level III, CLP Organics and Inorganics

SAMPLES: 084GW00102, 084GW00202, 172GW00202, 172GW00202RE, 570GW00102, 570GW00202, 570GW00302, 570GW02D02, 570GW03D02, 572GW00102, 572GW00202, 573GW00102, 573GW01D02, GDEGW01002, GDEGW01102, GDEGW01302, GDEGW10D02, GDEGW11D02, GDEGW13D02, GDETW001002, GDETW01302

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factor (RRF) of 2-chloroethyl vinyl ether was 0.040 for the standards analyzed on 7/8/96 on instrument R, which was below the 0.050 QC limit. The non-detect results for this compound in all SDG samples, except 570GW00302, GDEGW01002, GDEGW10D02 and GDETW01002, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/8/96 on instrument R for the following compounds:

bromomethane	32.4%
acetone	35.0%
2-chloroethyl vinyl ether	41.8%

2-Chloroethyl vinyl ether was previously qualified based on a low RRF in this calibration. There were no positive detections of the other two compounds in the associated samples after blank qualification. No further action was taken.

The Percent Relative Standard Deviation (%RSD) of bromomethane was 39.8%, which exceeded the 30% QC limit for the standards analyzed on 06/21/96 on instrument U. Since this compound was not detected in the associated samples, no action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.041 for the standard analyzed on 7/25/96 at 11:02 on instrument R, which was below the 0.050 QC limit. This compound was previously qualified based on the initial calibration. No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/25/96 at 11:02 on instrument R for the following compounds:

acetone	32.0%
2-hexanone	29.1%
2-butanone	33.4%

All results for these compounds in associated sample 570GW03D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.018 for the standard analyzed on 7/26/96 at 11:12 on instrument R, which was below the 0.050 QC limit. This compound was previously qualified based on the initial calibration. No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/26/96 at 11:12 on instrument R for the following compounds:

2-butanone	32.0%
vinyl acetate	72.7%
4-methyl-2-pentanone	38.4%
2-hexanone	41.2%
1,1,2,2-tetrachloroethane	32.7%
2-chloroethyl vinyl ether	55.0%

The non-detect results for 2-chloroethyl vinyl ether in associated samples were previously qualified based on the initial calibration. All results for the other compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 172GW00202, 570GW00102, 570GW00202, 570GW02D02, 572GW00102, 572GW00202, GDEGW01102, GDEGW01302, GDEGW11D02 and GDEGW13D02.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/23/96 at 12:13 on instrument U for the following compounds:

bromomethane	25.6%
chloroethane	26.8%
carbon disulfide	34.0%
vinyl acetate	42.7%
bromoform	32.2%

All results for these compounds in associated samples 570GW00302, GDEGW01002 and GDEGW10D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride and acetone were detected at 2 ug/L and 7 ug/L, respectively, in method blank VBLK2. These two compounds were not detected in associated sample 570GW03D02. No action was necessary.

Acetone was detected at 5 ug/L in method blank VBLK3. Positive detections of acetone in associated samples GDEGW11D02 and GDEGW13D02, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL. There were no other detections of acetone in the associated samples. No further action was taken.

Methylene chloride was detected at 1 ug/L in method blank VBLK4. Since the only associated sample was a trip blank, no action was required.

Trip Blanks:

Methylene chloride was detected at 2 ug/L in trip blank GDETW01002. This compound was not detected in the associated samples. No action was taken.

Carbon disulfide and 1,1,2-trichloroethane were detected at 2 ug/L and 1 ug/L, respectively, in trip blank GDETW01302. The positive detection of carbon disulfide in associated sample 572GW00102, which was less than 5X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being replaced with the CRQL. There were no other positive detections of these compounds in the associated samples. No further action was required.

TIC's:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

Eight LCS's were analyzed by the laboratory. Several %R's were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for two sets of field duplicate samples in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for 2-chloroethyl vinyl ether were rejected in 12 samples because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibrations:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/31/96 at 13:20 on instrument V for the following compounds:

indeno(1,2,3-cd)pyrene	26.8%
dibenz(a,h)anthracene	30.1%
benzo(g,h,i)perylene	28.8%

All results for these compounds in associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 570GW00302, GDEGW01002 and GDEGW10D02.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/1/96 at 08:22 on instrument S for the following compounds:

hexachloroethane	32.0%
benzoic acid	34.2%
hexachlorocyclopentadiene	79.5%
3,3'-dichlorobenzidine	56.8%

The positive results for benzoic acid in associated samples 572GW00202, GDEGW01102, GDEGW11D02 and GDEGW01302 were flagged as estimated (J). All other results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 172GW00202, 570GW00102, 570GW00202, 570GW02D02, 572GW00102, 572GW00202, GDEGW01102, GDEGW01302, GDEGW11D02 and GDEGW13D02.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/5/96 at 05:45 on instrument V for the following compounds:

1,2-dichlorobenzene	29.4%
2,2'-oxybis(1-chloropropane)	26.1%
4-methylphenol	25.9%
hexachloroethane	30.2%
benzoic acid	37.6%
2,4-dinitrophenol	32.3%
3,3'-dichlorobenzidine	28.6%

All results for these compounds in the associated sample 570GW03D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 9 ug/L in method blank SBLK1. This compound was not detected in the associated samples. No action was taken.

Bis(2-ethylhexyl)phthalate was detected at 1 ug/L in method blank SBLK2. Detections of this compound in the associated samples less than 10X the blank amount were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL. The associated samples were 572GW00102, 572GW00202, GDEGW01102, GDEGW11D02 and GDEGW13D02.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

The Surrogate Percent Recoveries (%R's) of terphenyl-d14 were below their 33-141% QC limits for following samples:

<u>Sample ID</u>	<u>%R</u>
172GW00202	32
572GW00102	32
GDEGW01002	26
GDEGW11D02	31

Since only one surrogate in the base/neutral fraction was outside QC limits for each of these samples with %R's greater than 10%, no action was required.

VI.) Laboratory Control Samples (LCS)

Four LCS's were analyzed by the laboratory. Several %R's were outside QC limits. Data validation action based on LCS recoveries was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG, so no action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two sets of field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance:

All Internal Standards Performance criteria were met, so no action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Differences (%D's) for alpha-BHC (26.0%) and beta-BHC (26.0%) on the primary column and alpha-BHC (30.0%) and gamma-BHC (27.0%) on the secondary column exceeded the 25% QC limit for the PEM4N standard analyzed on 8/10/96 at 00:09. All results for these compounds in associated samples GDEGW01102, GDEGW01302, GDEGW11D02 and GDEGW13D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Difference (%D) for endrin was 26.0% on the secondary column, which exceeded the 25% QC limit for the PEM4G standard analyzed on 7/30/96 at 02:36. The non-detect results for this compound in associated samples GDEGW01002 and GDEGW10D02 were flagged as estimated (UJ).

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) for endrin aldehyde was 21.8% on the primary column for the standards analyzed on 7/30/96, which exceeded the 20% QC limit. Since only one compound exceeded the QC limit with a %RSD less than 30%, no action was necessary.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed by the laboratory. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was taken.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisol Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC was not required for this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB9	antimony	2.70 ug/L	13.5 ug/L
CCB5	arsenic	4.10 ug/L	20.5 ug/L
PBW2I	barium	0.40 ug/L	2.00 ug/L
CCB3	beryllium	0.30 ug/L	1.50 ug/L
CCB3	chromium	1.30 ug/L	6.50 ug/L
PBW2I	copper	2.39 ug/L	12.0 ug/L
CCB1	silver	1.80 ug/L	9.00 ug/L
CCB3	vanadium	0.50 ug/L	2.50 ug/L
PBW2I	zinc	15.4 ug/L	77.0 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level) 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB4	antimony	-3.30 ug/L	16.5 ug/L
ICB1	barium	-0.30 ug/L	1.50 ug/L
PBW2I	calcium	-49.5 ug/L	248 ug/L
PBW2I	cobalt	-1.35 ug/L	6.75 ug/L
CCB8	copper	-1.80 ug/L	9.00 ug/L
CCB4	iron	-32.2 ug/L	161 ug/L
CCB5	magnesium	-66.7 ug/L	334 ug/L
CCB2	silver	-2.50 ug/L	12.5 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

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 detected in ICS Solution A at concentrations greater than the IDL:

arsenic	9 ug/L
barium	5 ug/L
cadmium	2 ug/L
chromium	2 ug/L
lead	3 ug/L
nickel	30 ug/L
selenium	12 ug/L
thallium	8 ug/L
vanadium	3 ug/L

These analytes should not be present. Magnesium was detected at a concentration greater than that of ICS Solution A in associated samples GDEGW10D02 and GDEGW11D02. All positive results for these analytes in the two samples were flagged as estimated (J).

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

barium	-2 ug/L
cobalt	-3 ug/L
copper	-3 ug/L
manganese	-1 ug/L
nickel	-1 ug/L
selenium	-3 ug/L
thallium	-11 ug/L
tin	-4 ug/L

Magnesium was detected at a concentration greater than that of ICS Solution A in associated samples GDEGW10D02 and GDEGW11D02. All non-detect results for these analytes in the two samples were flagged as estimated (UJ).

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) for barium (25.8%) and iron (11.6%) exceeded the 10% QC limit in dilution sample GDEGW01002L. All positive results for these two analytes in all SDG samples were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries (MS):

No MS sample was analyzed in this SDG. No action was taken.

IX.) Field Duplicates:

Samples 084GW00202 and 573GW00102 were analyzed in this SDG, while samples 084HW00202 and 573GH00102 were analyzed in SDG 26382A. All RPD's were within the 30% QC limit, so no action was required. See SDG 26382A for RPD tabulations.

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:

All laboratory data were acceptable with qualifications.

*ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) of dibutyltin (0.041) was below the 0.050 QC limit for the standard analyzed on 7/29/96 at 14:44. Since all continuing calibration criteria were met for reanalysis sample 172GW00202RE, no action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks for this SDG. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Three LCS's were analyzed with this SDG. All criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) System Performance:

All System Performance criteria were met, so no action was taken.

XII.) Overall Assessment of Data/General:

The reanalysis of sample 172GW00202 was considered by the validator to be of preferable data quality to the original analysis based on improved continuing calibration criteria. All laboratory data were acceptable without qualification.

*WET CHEMISTRY ANALYSES*

*CHLORIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive chloride detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this fraction. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) Field Duplicates:

Samples 084GW00202 and 573GW00102 were analyzed in this SDG, while samples 084HW00202 and 573HW00102 were analyzed in SDG 26382A. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u> chloride	<u>084HW00202</u> 7.7 ug/L	<u>084GW00202</u> 7.7 ug/L	<u>RPD</u> 0%
<u>Analyte</u> chloride	<u>573HW00102</u> 18.3 ug/L	<u>573GW00102</u> 17.6 ug/L	<u>RPD</u> 3.9%

Since the RPD's for chloride were within the 30% QC limit, no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no sulfate detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed for this fraction. No action was required.

VII.) Field Duplicates:

Samples 084GW00202 and 573GW00102 were analyzed in this SDG, while samples 084HW00202 and 573HW00102 were analyzed in SDG 26382A. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u> sulfate	<u>084HW00202</u> 12.4 ug/L	<u>084GW00202</u> 11.9 ug/L	<u>RPD</u> 4.1%
<u>Analyte</u> sulfate	<u>573HW00102</u> 60.5 ug/L	<u>573GW00102</u> 60.2 ug/L	<u>RPD</u> 0.5%

Since the RPD's for sulfate met the 30% QC limit, no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no TDS detections in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not required for TDS analysis. No action was taken.

VII.) Field Duplicates:

Samples 084GW00202 and 573GW00102 were analyzed in this SDG, while samples 084HW00202 and 573HW00102 were analyzed in SDG 26382A. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>084HW00202</u>	<u>084GW00202</u>	<u>RPD</u>
TDS	190 ug/L	198 ug/L	4.1%
<u>Analyte</u>	<u>573HW00102</u>	<u>573GW00102</u>	<u>RPD</u>
TDS	450 ug/L	288 ug/L	43.9%

Since the RPD's for TDS met the 30% QC limit, no action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

# 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: Charleston Naval Base, Zone E  
SERVICE ORDER NUMBER: 0117  
CONTRACTED LAB: Southwest Laboratories of Oklahoma  
EPA SOW/METHOD: EPA 8290  
VALIDATION GUIDELINES: EPA 8290, Professional Judgement  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: 2,3,7,8-substituted PCDD's and PCDF's  
  
SDG NUMBER: 26403A (Level IV)

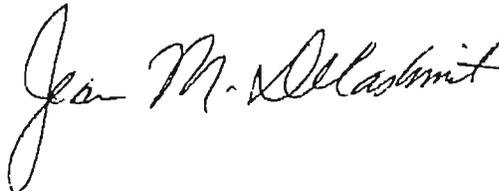
### SAMPLES:

<u>Client</u> <u>Sample #</u>	<u>Lab</u> <u>Sample #</u>	<u>Matrix</u>	<u>PCDD/</u> <u>PCDF</u>
GDEDW14D02	26419.01	Water	X
GDEEW14D02	26419.02	Water	X
GDEFW14D02	26419.03	Water	X

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK,  
FW = FIELD BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Kevin C. Harmon

RELEASE SIGNATURE:



## DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26403A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: GDEDW14D02, GDEEW14D02, GDEFW14D02

### *2,3,7,8-SUBSTITUTED PCDD'S AND PCDF'S*

#### I.) Holding Times:

All criteria were met, so no action was taken.

#### II.) HRGC/HRMS System Performance:

##### GC Column Performance:

All criteria were met, so no action was taken.

##### HRMS Resolution:

All criteria were met, so no action was required.

##### Mass Verification:

All criteria were met, so no action was taken.

##### MS Data Acquisition:

All criteria were met, so no action was taken.

#### III.) Calibration:

##### Calibration Range:

EPA Method 1613A calibration and internal standard concentration levels were used for the analyses. Comparing to EPA Method 8290, the calibration ranges of the two methods were not significantly different, so no action was deemed necessary.

Initial Calibration:

All criteria were met, so no action was taken.

Calibration Verifications:

All criteria were met, so no action was taken.

IV.) Blanks:

Method Blanks:

Several 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following highest concentrations:

<u>Method Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
DFBLK1	1234678-HpCDD	6.4	32
DFBLK1	OCDD	46.8	235
DFBLK2	123678-HxCDF	1.97	10
DFBLK2	234678-HxCDF	2.0	10
DFBLK2	OCDF	4.79	24

The associated samples were blanks, so no action was required.

Field Blanks:

Deionized water blank GDEDW14D02, equipment rinsate blank GDEEW14D02 and field blank GDEFW14D02 collected on 7/25/96 were analyzed. Several 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

<u>Field Blank</u>	<u>Compound</u>	<u>Conc.</u> <u>pg/L</u>	<u>Action Level</u> <u>pg/L</u>
GDEDW14D02	12378-PeCDD	15.5	80
	123678HxCDD	14.7	75
	1234678-HpCDD	22.1	110
	OCDD	55	275
	12378-PeCDF	8.3	42
	123678-HxCDF	14.2	70
	234678-HxCDF	3.36	17
	OCDF	40.8	205

The associated samples were blanks, so no action was required.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD samples were analyzed. One LCS sample was analyzed. All criteria were met, so no action was taken.

VII.) Duplicates:

No field duplicates samples were analyzed for dioxins. No action was taken.

VIII.) PCDD/PCDF Identifications:

Retention Times:

All criteria were met, so no action was taken.

Ion Abundance:

All criteria were met, so no action was taken.

S/N Ratio:

All criteria were met, so no action was taken.

PCDPE (Polychlorinated Diphenyl Ether) Interferences:

All criteria were met, so no action was taken.

Second Column Confirmation:

All criteria were met, so no action was taken.

IX.) Overall Assessment of Data/General:

All data were acceptable without qualifications. Laboratory "X" flags and "B" flags were removed by the validator.

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0117  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals, Cyanide, Organotin, Chloride, Sulfate, Total Dissolved Solids (TDS)  
SDG NUMBERS: 26403A (Appendix IX, Level IV)  
26403B (Level III)

### SAMPLES:

#### SDG 26403A (Level IV):

Client	Lab		Volatile	Semi-	Pesticides/	Total	
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCBs</u>	<u>Metals</u>	<u>Cyanide</u>
569HW01D02*	26419.04	Water	X	X		X	
569HW00202*	26419.05	Water	X	X		X	
GDEDW14D02	26419.01	Water	X	X	X	X	X
GDEEW14D02	26419.02	Water	X	X	X	X	X
GDEFW14D02	26419.03	Water	X	X	X	X	X

Client	Lab						
<u>Sample#</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organotin</u>	<u>Chloride</u>	<u>Sulfate</u>	<u>TDS</u>	
569HW01D02*	26419.04	Water		X	X	X	
569HW00202*	26419.05	Water		X	X	X	
GDEDW14D02	26419.01	Water	X	X	X	X	
GDEEW14D02	26419.02	Water	X	X	X	X	
GDEEW14D02RE	26419.02RE	Water	+				
GDEFW14D02	26419.03	Water	X	X	X	X	

\* = Corresponding samples 569GW01D02 and 569GW00202 were analyzed in SDG 26403B.  
 + = Non-billable Analysis

DW = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK,  
 H = FIELD DUPLICATE, RE = REANALYSIS

SDG 26403B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCBs	Total Metals
025GW00102	26418.05	Water	X	X	X	X
551GW00102	26403.06	Water	X	X		X
551GW00202	26418.03	Water	X	X		X
551GW02D02	26418.04	Water	X	X		X
563GW00102	26403.07	Water	X	X		X
563GW01D02	26403.08	Water	X	X		X
563GW00202	26403.09	Water	X	X		X
569GW00102	26418.06	Water	X	X		X
569GW01D02*	26418.07	Water	X	X		X
569GW00202*	26418.08	Water	X	X		X
572GW00302	26403.05	Water	X	X		X
GDEGW01202	26403.01	Water	X	X	X	X
GDEGW12D02	26403.02	Water	X	X	X	X
GDEGW14D02	26418.01	Water	X	X	X	X
GDEGW01502	26418.02	Water	X	X	X	X
569TW00202	26418.09	Water	X			
GDETW12D02	26403.10	Water	X			
GDEGW12D02MS	26403.03MS	Water	+	+	+	
GDEGW12D02MSD	26403.04MSD	Water	+	+	+	
GDEGW12D02S	26403.03D	Water				+
GDEGW12D02SD	26403.04SD	Water				+

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
025GW00102	26418.05	Water		X	X	X
551GW00102	26403.06	Water		X	X	X
551GW00202	26418.03	Water		X	X	X
551GW02D02	26418.04	Water		X	X	X
563GW00102	26403.07	Water		X	X	X
563GW01D02	26403.08	Water		X	X	X
563GW00202	26403.09	Water		X	X	X
569GW00102	26418.06	Water		X	X	X
569GW01D02*	26418.07	Water		X	X	X
569GW00202*	26418.08	Water		X	X	X
572GW00302	26403.05	Water		X	X	X
GDEGW01202	26403.01	Water	X	X	X	X
GDEGW12D02	26403.02	Water	X	X	X	X
GDEGW14D02	26418.01	Water	X	X	X	X

Client	Lab					
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Cyanide</u>	<u>Chloride</u>	<u>Sulfate</u>	<u>TDS</u>
GDEGW01502	26418.02	Water	X	X	X	X
GDEGW12D02MS	26403.03MS	Water	+	+	+	+
GDEGW12D02MSD	26403.04MSD	Water	+	+	+	+

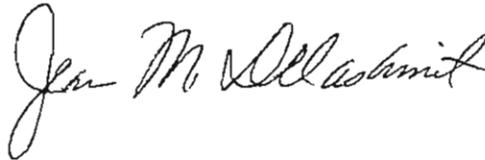
\* = Corresponding field duplicate samples 569HW01D02 and 569HW00202 were analyzed in SDG 26403A.

+ = Non-billable Analysis

MS / S = MATRIX SPIKE, MSD / SD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE:



### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc - 26403A Appendix IX, CLP Organic and Inorganics

SAMPLES: 569HW01D02, 569HW00202, GDEDW14D02, GDEEW14D02, GDEEW14D02RE, GDEFW14D02

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 7/8/96 on instrument R for the following compounds:

acrolein	0.047
acetonitrile	0.040
2-chloroethyl vinyl ether	0.040
isobutyl alcohol	0.015
1,4-dioxane	0.004
vinyl acetate	0.044

All non-detect results for these compounds in the SDG samples were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/8/96 on instrument R for the following compounds:

bromomethane	32.4%
acetone	35.0%
2-chloroethyl vinyl ether	41.8%
1,4-dioxane	45.9%

The non-detect results for 2-chloroethyl vinyl ether and 1,4-dioxane was previously rejected based on low RRF's in this calibration. Since there was no positive detections of the other compounds in the SDG samples after blank qualifications, no further action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 8/1/96 at 14:30 on instrument R for the following compounds:

acetonitrile	0.039
isobutyl alcohol	0.013
1,4-dioxane	0.003
vinyl acetate	0.007
dichlorodifluoromethane	0.026

The non-detect results for acetonitrile, isobutyl alcohol, 1,4-dioxane and vinyl acetate in the associated samples were previously rejected based on low RRF's in the initial calibration. The non-detect results for dichlorodifluoromethane were rejected (R) in associated sample 569HW00202 and blanks GDEDW14D02, GDEEW14D02 and GDEFW14D02.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 8/1/96 at 14:30 on instrument R for the following compounds:

acrolein	25.5%
dichlorodifluoromethane	31.6%
vinyl acetate	84.1%

The non-detect results for these compounds in the associated samples were previously rejected based on low RRF's in the initial and continuing calibrations. No further action was necessary.

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 8/6/96 at 00:48 on instrument R for the following compounds:

acrolein	0.040
acetonitrile	0.031
isobutyl alcohol	0.009
1,4-dioxane	0.001

The non-detect results for these compounds in associated sample 569HW01D02 were previously rejected based on low RRF's in the initial calibration and continuing calibrations. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/6/96 at 00:48 on instrument R for the following compounds:

acetone	32.2%
vinyl acetate	68.2%
2-hexanone	30.9%
4-methyl-2-pentanone	32.1%
1,1,2,2-tetrachloroethane	26.8%
2-chloroethyl vinyl ether	95.0%
trans-1,4-dichloro-2-butene	28.0%
isobutyl alcohol	40.0%

1,4-dioxane	75.0%
dichlorodifluoromethane	34.2%
1,2-dibromo-3-chloropropane	27.1%

The non-detect results for isobutyl alcohol, 1,4-dioxane, dichlorodifluoromethane, 2-chloroethyl vinyl ether and vinyl acetate were previously rejected because of low RRF's in the initial and continuing calibrations. All results for the other compounds in associated sample 569HW01D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride was detected at 1 ug/L in method blank VBLK2. Methylene chloride was qualified using the equipment rinsate blank. No further action was necessary.

Deionized Water Blank:

Acetone, methylene chloride, and chlorobenzene were detected at 25 ug/L, 11 ug/L and 4 ug/L, respectively, in deionized water blank GDEDW14D02. These compounds were qualified based on the equipment rinsate blank. No further action was taken.

Equipment Rinsate Blank:

Acetone, methylene chloride, carbon disulfide and chlorobenzene were detected at 22 ug/L, 12 ug/L, 2 ug/L and 4 ug/L, respectively, in equipment rinsate blank GDEEW14D02. The positive detections of acetone and methylene chloride in associated samples 569HW01D02 and 569HW00202, which were less than 10X the blank amounts, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample. The other two compounds were not detected in the associated samples. No further action was taken.

Field Blank:

Acetone, methylene chloride, acetonitrile and chlorobenzene were detected at 32 ug/L, 11 ug/L, 41 ug/L and 3 ug/L, respectively, in field blank GDEFW14D02. Acetone and methylene chloride were qualified based on the equipment rinsate blank. Acetonitrile and chlorobenzene were not detected in the associated samples. No further action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed for this SDG. Several %R's were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the two sets of field duplicate samples associated with this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for isobutyl alcohol, acrolein, acetonitrile, acetonitrile, vinyl acetate and 1,4-dioxane were rejected in all SDG samples and blanks because of low RRF's in the initial and continuing calibrations. In addition, non-detect results for dichlorodifluoromethane were rejected in sample 569HW00202 and the three field blanks because of a low RRF in the continuing calibration. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

### III.) Calibration:

#### Initial Calibration:

The average Relative Response Factors (RRF's) for aramite (0.030) and hexachlorophene (0.034) were below the 0.050 QC limit for the standards analyzed on 8/6/96 on instrument A. The non-detect results for these compounds in all SDG samples were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 8/6/96 on instrument A for the following compounds:

m-cresol	35.1%
o-toluidine	30.3%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	34.2%
hexachloropropene	33.3%
1,2,4,5-tetrachlorobenzene	34.8%
safrole	33.6%
1,4-naphthaquinone	33.6%
1,3-dinitrobenzene	34.7%
pentachlorobenzene	32.3%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.6%
2-naphthylamine	33.8%
diphenylamine	31.6%
sulfotepp	35.8%
1,3,5-trinitrobenzene	31.9%
4-aminobiphenyl	30.3%
pronamide	34.0%
pentachloronitrobenzene	47.1%
disulfoton	30.4%
methyl parathion	36.1%
parathion	39.1%
methapyrilene	41.3%
isodrin	34.9%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
acetamidofluorene	30.4%
7,12-dimethylbenz(a)anthracene	48.0%
p-phenylenediamine	38.1%

These compounds were not detected in the associated samples. No action was required.

#### Continuing Calibration:

The Relative Response Factors (RRF's) for hexachlorophene (0.029) and aramite (0.044) were below the 0.050 QC limit for the standards analyzed on 8/6/96 at 11:05 on instrument A. The non-detect

results for the two compounds in the associated samples were previously rejected because of low RRFs in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/6/96 at 11:05 on instrument A for the following compounds:

46.6%	hexachloropropene
27.2%	2,4-dinitrophenol
27.9%	4-nitrophenol
50.1%	pentachlorobenzene
82.0%	ethyl methanesulfonate
70.7%	n-nitrosodimethylamine
42.8%	n-nitrosomethylethylamine
56.8%	2-picoline
83.3%	acetophenone
27.4%	nitrobenzene
88.9%	n-nitrosopyrrolidine
75.5%	n-nitrosomorpholine
108%	n-nitroso-piperidine
73.1%	o-toluidine
116%	o,o,o-triethyl phosphorothioate
71.7%	safrole
69.3%	isosafrole
123%	n-nitroso-n-butylamine
62.1%	1,4-naphthoquinoline
48.4%	1,3-dinitrobenzene
67.5%	1-naphthylamine
27.4%	2-naphthylamine
48.4%	thionazin
64.5%	phorate
73.9%	phenacetin
65.0%	diallate
89.5%	dimethoate
66.7%	4-aminobiphenyl
27.5%	pronamide
102%	pentachloronitrobenzene
68.8%	disulfoton
114%	parathion
97.1%	methyl parathion
46.4%	methapyriene
94.0%	isodrin
45.9%	aramite
21.7%	famphur
51.7%	m-cresol
49.4%	acetamidofluorine
88.1%	4-nitroquinoline-1-oxide
52.3%	diphenylamine
144%	kepone

chlorobenzilate	66.0%
3,3'-dimethylbenzidine	104%
sulfotep	83.1%
a,a-dimethyphenethylamine	26.1%
1,3,5-trinitrobenzene	92.0%
hexachlorophene	39.8%
pyridine	92.0%

The non-detect results for aramite and hexachlorophene were previously rejected because of low RRF's in the initial calibration. The results for the other compounds in associated samples 569HW01D01 and 569HW00202, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blank:

There were no positive detections in the method blank. No action was taken.

##### Deionized Water Blank:

Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected at 4 ug/L and 1 ug/L, respectively, in deionized water blank GDEDW14D02. The positive detection of bis(2-ethylhexyl)phthalate in sample 569HW01D02, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRQL. There were no other positive detections of these compounds in the associated samples. No further action was required.

##### Field Blank:

Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected at 2 ug/L and 1 ug/L, respectively, in field blank GDEFW14D02. Qualification of these compounds were previously performed based on the deionized water blank. No further action was necessary.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

#### VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. Several %R's were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

#### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

No MS / MSD samples were analyzed in this SDG. No action was taken.

#### VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the two sets of field duplicate samples in this

SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene were rejected in all SDG samples because of low RRF's in the calibrations. All other laboratory data were acceptable with qualifications.

#### *PESTICIDES / PCBs*

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All Pesticides Instrument Performance criteria were met. No action was necessary.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was necessary.

IX.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC was not required for samples in this SDG. No action was taken.

XI.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was necessary.

XII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
EW	aluminum	5.70 ug/L	28.5 ug/L
EW	barium	0.57 ug/L	2.85 ug/L
EW	beryllium	0.33 ug/L	1.65 ug/L
EW	calcium	113 ug/L	565 ug/L
EW	cobalt	2.30 ug/L	11.5 ug/L
FW	copper	2.40 ug/L	12.0 ug/L
EW	iron	35.4 ug/L	177 ug/L
EW	lead	2.40 ug/L	12.0 ug/L
EW	silver	4.10 ug/L	20.5 ug/L
FW	thallium	4.20 ug/L	21.0 ug/L
EW	vanadium	1.50 ug/L	7.50 ug/L
EW	zinc	20.8 ug/L	104 ug/L

EW = Equipment Rinsate Blank (GDEEW14D02), FW = Field Blank (GDEFW14D02)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples) for which the contaminated blank was an associated equipment rinsate or field blank were flagged as undetected (U).

Negative results with absolute values greater than the IDL were found for the following analytes:

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB2	aluminum	-18.2 ug/L	91.0 ug/L
CCB2	barium	-0.80 ug/L	4.00 ug/L
CCB2	cobalt	-1.10 ug/L	5.50 ug/L
CCB2	copper	-0.90 ug/L	4.50 ug/L
CCB2	silver	-4.00 ug/L	20.0 ug/L
CCB2	vanadium	-1.40 ug/L	7.00 ug/L

CCB = Continuing Calibration Blank

All associated positive sample results less than 5X the absolute value of the negative blank result and all 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 detected in ICS Solution A at concentrations greater than the IDL:

barium	2 ug/L
cadmium	1 ug/L
chromium	1 ug/L
lead	2 ug/L
selenium	5 ug/L
thallium	6 ug/L
vanadium	2 ug/L

These analytes should not be present. Additionally, negative results were observed for copper (-2 ug/L) and tin (-3 ug/L) in ICS Solution A at absolute values greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

No Matrix Spike samples were analyzed in this SDG. No action was required.

IX.) Field Duplicates:

Field duplicate samples 569HW01D02 and 569HW00202 were analyzed in this SDG while corresponding samples 569GW01D02 and 569GW00202 were analyzed in SDG 26403B. The calculable Relative Percent Differences (RPD's) were:

<u>Analyte</u>	<u>569HW01D02, ug/L</u>	<u>569GW01D02, ug/L</u>	<u>RPD</u>
barium	34.8	34.2	1.4
calcium	65600	66200	0.9
iron	739	758	2.5
magnesium	8640	8720	0.9
manganese	105	105	0
sodium	37600	37900	0.8

<u>Analyte</u>	<u>569HW00202, ug/L</u>	<u>569GW00202, ug/L</u>	<u>RPD</u>
barium	13.3	12.8	3.8
calcium	20000	20100	0.5
iron	216	179	18.8
magnesium	2940	2930	0.3
manganese	73.8	74.2	0.5
sodium	12500	12300	1.6

All RPD's were within the 30% QC limit for water samples. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the sample in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. 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:

All laboratory data were acceptable with qualifications.

### *ORGANOTIN*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed in this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

No MS / MSD analyses were performed in this SDG. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

The area count Percent Recovery of ISTD phenanthrene-d10 (208%) in blank GDEEW14D02 exceeded the 50-200% QC limits. There were no positive results for this blank. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIII.) Overall Assessment of Data/General:

The original analysis of blank GDEEW14D02 was considered by the validator to be of preferable data quality to the reanalysis because of a better holding time with no ISTD recovery improvement in the reanalysis. All laboratory data were acceptable without qualification.

*CHLORIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

Chloride was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections of chloride in the three field blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this SDG. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

No MS / MSD samples were analyzed in this SDG. No action was taken.

VII.) Field Duplicates:

Samples 569HW01D02 and 569HW00202 were analyzed in this SDG while corresponding samples 569GW01D02 and 569GW00202 were analyzed in SDG 26403B. The Relative Percent Difference (RPD) was 0% for set 569HW01D02 / 569GW01D02 and 4.5% for set 569HW00202 / 569GW00202. Since both RPD's were within the 30% QC limit for water samples, no action was necessary.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

## *SULFATE*

### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

### II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

### III.) Blanks:

#### Method Blanks:

Sulfate was not detected in the method blanks. No action was necessary.

#### Deionized Water, Equipment Rinsate and Field Blanks:

Sulfate was not detected in the three field blanks. No action was required.

### IV.) Laboratory Check Samples (LCS):

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

### V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this SDG. No action was taken.

### VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

No MS / MSD samples were analyzed in this SDG. No action was required.

### VII.) Field Duplicates:

Samples 569HW01D02 and 569HW00202 were analyzed in this SDG while samples 569GW01D02 and 569GW00202 were analyzed in SDG 26403B. The Relative Percent Difference (RPD) was 0.1% for set 569HW01D02 / 569GW01D02 and 0.4% for set 569HW00202 / 569GW00202. Since both RPD's were within the 30% QC limit for water samples, no action was necessary.

### VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 26 mg/L in deionized water blank GDEDW14D02, at 20 mg/L in equipment rinsate blank GDEEW14D02 and at 12 mg/L in field blank GDEFW14D02. All positive results for TDS in all SDG samples exceeded 5X the highest blank detection, so no action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

No MS / MSD samples were analyzed in this SDG. No action was required.

VII.) Field Duplicates:

Samples 569HW01D02 and 569HW00202 were analyzed in this SDG while samples 569GW01D02 and 569GW00202 were analyzed in SDG 26403B. The Relative Percent Difference (RPD) was 6.3% for set 569HW01D02 / 569GW01D02 and 5.3% for set 569HW00202 / 569GW00202. Since both RPD's were within the 30% QC limit for water samples, no action was necessary.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26403B Level III, CLP Organics and Inorganics

SAMPLES: 025GW00102, 551GW00102, 551GW00202, 551GW02D02, 563GW00102, 563GW01D02, 563GW00202, 569GW00102, 569GW01D02, 569GW00202, 572GW00302, GDEGW01202, GDEGW12D02, GDEGW14D02, GDEGW01502, 569TW00202, GDETW12D02, GDEGW12D02MS, GDEGW12D02MSD, GDEGW12D02S, GDEGW12D02SD

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factors (RRF's) for vinyl acetate and 2-chloroethyl vinyl ether were 0.044 and 0.040, respectively, for the standards analyzed on 7/8/96 on instrument R, which were below the 0.050 QC limit. The positive result for vinyl acetate in sample GDEGW12D02 was flagged as estimated (J). All other results for these compounds in the SDG samples, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviation (%RSD) for bromomethane (32.4%) and 2-chloroethyl vinyl ether (41.8%) exceeded the 30% QC limit for the standards analyzed on 7/8/96 on instrument R. All results for 2-chloroethyl vinyl ether were previously rejected because of a low RRF in this calibration. There were no positive detections of bromomethane in the SDG samples, so no further action was taken.

##### Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.028 for the standard analyzed on 7/29/96 at 14:32 on instrument R, which was below the 0.050 QC limit. The non-detect results for this compound in the SDG samples were previously rejected based on the initial calibration. No further action was necessary.

The Percent Differences (%D's) of vinyl acetate and 2-chloroethyl vinyl ether were 43.2% and 30.0%, respectively, for the standard analyzed on 7/31/96 at 14:32 on instrument R. The non-detect results for

these compounds in the associated samples were previously rejected because of low RRF's in the initial calibration. No further action was taken.

The Percent Difference (%D) of vinyl acetate was 70.5% for the standard analyzed on 7/30/96 at 18:33 on instrument R. The non-detect results for this compound in the associated samples were previously rejected because of a low RRF in the initial calibration. No further action was taken.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.032 for the standard analyzed on 7/31/96 at 12:16 on instrument R, which was below the 0.050 QC limit. The non-detect results for this compound in the associated samples were previously rejected based on the initial calibration. No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 7/31/96 at 12:16 on instrument R for the following compounds:

2- butanone	27.2%
4-methyl-2-pentanone	27.0%
2-hexanone	27.9%
vinyl acetate	61.4%

The non-detect results for vinyl chloride in the associated samples were previously rejected based on low RRF's in the initial calibration. The non-detect results for the other three compounds in the associated samples were flagged as estimated (UJ). The associated samples were 025GW00102, 551GW00202, 551GW02D02, 569GW00102, 569GW01D02 and 569GW00202.

#### IV.) Blanks:

##### Method Blanks:

Methylene chloride was detected at 1 ug/L and 14 ug/L, respectively, in method blanks VBLK1 and VBLK2. Methylene chloride was qualified using the equipment rinsate blank. No further action was necessary.

Acetone was detected at 17 ug/L and 13 ug/L, respectively, in method blanks VBLK2 and VBLK3. Acetone was qualified using the equipment rinsate blank. No further action was necessary.

##### Deionized Water Blank:

Acetone, methylene chloride, and chlorobenzene were detected at 25 ug/L, 11 ug/L and 4 ug/L, respectively, in deionized water blank GDEDW14D02, which was analyzed in SDG 26403A. These compounds were qualified based on the equipment rinsate blank. No further action was taken.

##### Equipment Rinsate Blank:

Acetone, methylene chloride, carbon disulfide and chlorobenzene were detected at 22 ug/L, 12 ug/L, 2 ug/L and 4 ug/L, respectively, in equipment rinsate blank GDEEW14D02, which was analyzed in SDG 26403A. The positive detections of acetone and methylene chloride in all associated SDG samples, which were less than 10X the blank amounts, were flagged as undetected (U) with the detection limit

being raised to the amount of contamination in each sample. The positive detections of carbon disulfide in associated samples 551GW00102, GDEGW01202, GDEGW12D02 and GDEGW01502, which were less than 5X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL. Chlorobenzene was not detected in the associated samples. No further action was taken.

#### Field Blank:

Acetone, methylene chloride and chlorobenzene were detected at 32 ug/L, 11 ug/L, and 3 ug/L, respectively, in field blank GDEFW14D02. Acetone and methylene chloride were qualified based on the equipment rinsate blank. Chlorobenzene was not detected in the associated samples. No further action was taken.

#### Trip Blanks:

Methylene chloride was detected at 1 ug/L in trip blank 569TW00202, and carbon disulfide was detected at 1 ug/L in trip blank GDETW12D02. Both of these compounds were previously qualified based on the equipment rinsate blank. No further action was taken.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

#### VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed with this SDG. Several %R's were outside the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

#### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was taken.

#### VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the two sets of field duplicate samples associated with this SDG. No action was necessary.

#### IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was necessary.

#### X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

#### XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for vinyl acetate and 2-chloroethyl vinyl ether were rejected in the SDG samples because of low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was necessary.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of hexachlorocyclopentadiene was 32.3% for the standards analyzed on 7/31/96 on instrument S, which exceeded the 30% QC limit. There were no positive detections of this compound in the associated samples. No action was taken.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/1/96 at 08:22 on instrument S for the following compounds:

hexachloroethane	32.0%
benzoic acid	34.2%
hexachlorocyclopentadiene	79.5%
3,3'-dichlorobenzidine	56.8%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 551GW00102, 572GW00302, GDEGW01202 and GDEGW012D02.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/1/96 at

09:28 on instrument V for the following compounds:

1,2-dichlorobenzene	28.6%
3,3'-dichlorobenzidine	47.3%
indeno(1,2,3-cd)pyrene	48.2%
dibenz(a,h)anthracene	37.2%
benzo(g,h,i)perylene	34.5%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 025GW00102, 551GW00202, 551GW02D02 and 569GW00102.

The Percent Difference (%D) of hexachlorocyclopentadiene was 30.9% for the standard analyzed on 8/2/96 at 09:33 on instrument V, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample 569GW00202 was flagged as estimated (UJ).

The Percent Differences (%D's) of hexachlorocyclopentadiene and 2,4-dinitrophenol were 34.9% and 38.0%, respectively, for the standard analyzed on 8/15/96 at 10:55 on instrument V, which exceeded the 25% QC limit. The non-detect results for these compound in associated samples 569GW01D02 and GDEGW14D02 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 1 ug/L and 3 ug/L, respectively, in method blanks SBLK1 and SBLK2. Qualification of this compound was performed based on the deionized water blank. No further action was necessary.

Deionized Water Blank:

Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected at 4 ug/L and 1 ug/L, respectively, in deionized water blank GDEDW14D02, which was analyzed in SDG26403A. Di-n-butylphthalate was not detected in the associated samples. The positive detections of bis(2-ethylhexyl)phthalate in the associated samples, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL. The associated samples were 025GW00102, 563GW00102, 563GW00202, GDEGW01202 and GDEGW12D02.

Field Blank:

Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected at 2 ug/L and 1 ug/L, respectively, in field blank GDEFW14D02. Qualification of these compounds were previously performed based on the deionized water blank. No further action was necessary.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) of terphenyl-d14 was 31% in sample 563GW00102, which was below the 33-141% QC limits. Since only one surrogate was outside QC limits in the base/neutral

fraction, no action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Two %R's were below the QC limits. Data validation action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) of n-nitroso-di-n-propylamine was 40% in spiked sample GDEGW12D02MSD, which was below the 41-116% QC limits. The non-detect result for this compound in unspiked sample GDEGW12D02 was flagged as estimated (UJ).

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the two sets of field duplicate samples in this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD's):

All Internal Standard Performance criteria were met, so no action was taken.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

## *PESTICIDES/PCB's*

### I.) Holding Times:

All Holding Time criteria were met, so no action was required.

### II.) Instrument Performance:

The Percent Differences (%D's) for alpha-BHC (31.0%), beta-BHC (34.0%) and gamma-BHC (31.0%) exceeded the 25% QC limit for PEM4L analyzed on 8/8/96 at 14:39 on the primary column. In addition, the %D for endrin (30.4%) exceeded the 25% QC limit for PEM4L on the secondary column. The non-detect results for these compounds in the associated samples were flagged as estimated (UJ). The associated samples were 025GW00102, GDEGW14D02 and GDEGW01502.

The Percent Differences (%D's) for alpha-BHC (26.0%) and beta-BHC (26.0%) exceeded the 25% QC limit for PEM4N analyzed on 8/10/96 at 00:09 on the primary column. In addition, the %D for gamma-BHC (30.4%) exceeded the 25% QC limit for PEM4N on the secondary column. The non-detect results for these compounds in the associated samples were flagged as estimated (UJ). The associated samples were GDEGW01202 and GDEGW12D02.

### III.) Calibration:

#### Initial Calibration:

All Initial Calibration criteria were met. No action was necessary.

#### Continuing Calibration:

All Continuing Calibration criteria were met. No action was taken.

### IV.) Blanks:

#### Method Blanks:

There were no positive detections in the method blanks. No action was required.

#### Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 26403A. No action was necessary.

### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

### VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. Several %R's were outside the QC limits. Data validation

action based on LCS recoveries was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Percent Difference criteria were met. No action was taken.

IX.) Field Duplicates:

There were no calculable Relative Percent Differences for the two sets of field duplicate samples in this SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC was not required for the samples in this SDG. No action was taken.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB6	antimony	3.20 ug/L	16.0 ug/L
EW	aluminum	5.70 ug/L	28.5 ug/L
CCB2	arsenic	4.10 ug/L	20.5 ug/L
EW	barium	0.57 ug/L	2.85 ug/L
EW	beryllium	0.33 ug/L	1.65 ug/L
EW	calcium	113 ug/L	565 ug/L
CCB3	chromium	1.30 ug/L	6.50 ug/L
EW	cobalt	2.30 ug/L	11.5 ug/L
FW	copper	2.40 ug/L	12.0 ug/L
EW	iron	35.4 ug/L	177 ug/L
EW	lead	2.40 ug/L	12.0 ug/L
EW	silver	4.10 ug/L	20.5 ug/L
FW	thallium	4.20 ug/L	21.0 ug/L
EW	vanadium	1.50 ug/L	7.50 ug/L
EW	zinc	20.8 ug/L	104 ug/L

CCB = Continuing Calibration Blank, EW = Equipment Rinsate Blank, FW = Field Blank

The equipment rinsate and field blanks were analyzed in SDG 26403A. All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water samples) for which the contaminated blank was an associated calibration, equipment rinsate or field blank were flagged as undetected (U).

Negative results with absolute values greater than the IDL were found for the following analytes:

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB7	aluminum	-18.2 ug/L	91.0 ug/L
CCB4	antimony	-3.30 ug/L	16.5 ug/L
CCB7	barium	-0.80 ug/L	4.00 ug/L
PBW	calcium	-49.5 ug/L	248 ug/L
PBW	cobalt	-1.35 ug/L	6.75 ug/L
CCB7	copper	-0.90 ug/L	4.50 ug/L
CCB4	iron	-32.2 ug/L	161 ug/L
CCB2	magnesium	-66.7 ug/L	334 ug/L
CCB7	silver	-4.00 ug/L	20.0 ug/L
CCB7	vanadium	-1.40 ug/L	7.00 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank result and all 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:

arsenic	8 ug/L
barium	4 ug/L
cadmium	1 ug/L
chromium	1 ug/L
lead	3 ug/L
nickel	30 ug/L
selenium	5 ug/L
sodium	151 ug/L
vanadium	3 ug/L

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

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

cobalt	-2 ug/L
copper	-3 ug/L
potassium	-486 ug/L
selenium	-3 ug/L
thallium	-4 ug/L
tin	-3 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the associated sample 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 Difference (%D) was 14.9% for sodium in dilution sample GDEGW12D02L, which exceeded the 10% QC limit. All positive results for sodium in the associated samples were flagged as estimated (J). The associated samples were 551GW00102, 563GW00102, 563GW01D02, 563GW00202, 572GW00302, GDEGW01202 and GDEGW12D02.

The Serial Dilution Percent Difference (%D) was 400% for potassium in dilution sample GDEGW14D02L, which exceeded the 10% QC limit. All positive results for potassium in the associated samples were flagged as estimated (J). The associated samples were 025GW00102, 551GW00202, 551GW02D02, 569GW00102, 569GW01D02, 569GW00202, GDEGW14D02 and GDEGW01502.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries (S / SD):

All S / SD criteria were met. No action was taken.

The Percent Recoveries (%R's) were miscalculated for potassium in spiked samples GDEGW12D02S and GDEGW12D02SD. The laboratory reported results of -288% for both %R's. The correct %R results were 112% for both matrix spike samples. In addition the sample concentrations of iron, magnesium and sodium exceeded the concentration of the spike added by more than 4X. No action was necessary.

IX.) Field Duplicates:

Samples 569GW01D02 and 569GW00202 were analyzed in this SDG while field duplicate samples 569HW01D02 and 569HW00202 were analyzed in SDG 26403B. The calculable R's were:

<u>Analyte</u>	<u>569HW01D02, ug/L</u>	<u>569GW01D02, ug/L</u>	<u>RPD</u>
barium	34.8	34.2	1.4
calcium	65600	66200	0.9
iron	739	758	2.5
magnesium	8640	8720	0.9
manganese	105	105	0
sodium	37600	37900	0.8

<u>Analyte</u>	<u>569HW00202, ug/L</u>	<u>569GW00202, ug/L</u>	<u>RPD</u>
barium	13.3	12.8	3.8
calcium	20000	20100	0.5
iron	216	179	18.8
magnesium	2940	2930	0.3
manganese	73.8	74.2	0.5
sodium	12500	12300	1.6

All RPD's were within the 30% QC limit for water samples. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. 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:

All laboratory data were acceptable with qualifications.

XIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*CHLORIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

Chloride was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections of chloride in the three field blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this SDG. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was taken.

VII.) Field Duplicates:

Samples 569GW01D02 and 569GW00202 were analyzed in this SDG while field duplicate samples 569HW01D02 and 569HW00202 were analyzed in SDG 26403A. The Relative Percent Difference (RPD) was 0% for set 569HW01D02 / 569GW01D02 and 4.5% for set 569HW00202 / 569GW00202. Since both RPD's were within the 30% QC limit for water samples, no action was necessary.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*SULFATE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

Sulfate was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfate was not detected in the three field blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Field Duplicates:

Samples 569GW01D02 and 569GW00202 were analyzed in this SDG while samples 569HW01D02 and 569HW00202 were analyzed in SDG 26403A. The Relative Percent Difference (RPD) was 0.1% for set 569HW01D02 / 569GW01D02 and 0.4% for set 569HW00202 / 569GW00202. Since both RPD's were within the 30% QC limit for water samples, no action was necessary.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 26 mg/L in deionized water blank GDEDW14D02, at 20 mg/L in equipment rinsate blank GDEEW14D02 and at 12 mg/L in field blank GDEFW14D02. The three field blanks were analyzed in SDG 26403A. All positive results for TDS in the SDG samples exceeded 5X the highest blank detection, so no action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

No Duplicate Sample Analysis was performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

No MS / MSD samples were analyzed in this SDG. No action was required.

VII.) Field Duplicates:

Samples 569GW01D02 and 569GW00202 were analyzed in this SDG while field duplicate samples 569HW01D02 and 569HW00202 were analyzed in SDG 26403A. The Relative Percent Difference (RPD) was 6.3% for set 569HW01D02 / 569GW01D02 and 5.3% for set 569HW00202 / 569GW00202. Since both RPD's were within the 30% QC limit for water samples, no action was necessary.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

# 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: Charleston Navel Base, Zone E  
SERVICE ORDER NUMBER: 0120  
CONTRACTED LAB: Southwest Laboratory of Oklahoma, Inc.  
QA/QC LEVEL: EPA Level III / Level IV  
EPA METHOD: EPA SOW 3/90  
VALIDATION GUIDELINES: USEPA CLP National Functional Guidelines for Organic Data Review, 1994; USEPA CLP National Functional Guidelines for Inorganic Data Review, 1994  
SAMPLE MATRIX: Water  
TYPES OF ANALYSES: Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Total Metals and Cyanide, Chloride, Sulfate, Total Dissolved Solids (TDS)  
SDG NUMBERS: 26436A (Appendix IX, Level IV)  
26436B (Level III)

### SAMPLES:

#### SDG 26436A (Level IV):

Client	Lab		Volatile	Semi-	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>Metals</u>
559HW03D02	26466.01	Water	X	X	X

Client	Lab		Cyanide	Chlorides	Sulfates	TDS
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>				
559HW03D02	26466.01	Water	X	X	X	X

H = FIELD DUPLICATE

#### SDG 26436 (Level III):

Client	Lab		Volatile	Semi-	Pesticides/	Total
<u>Sample #</u>	<u>Sample #</u>	<u>Matrix</u>	<u>Organics</u>	<u>volatiles</u>	<u>PCB's</u>	<u>Metals</u>
025GW00202	26436.04	Water	X	X	X	X
025GW00302	26436.05	Water	X	X	X	X
025GW00402	26436.06	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi- volatiles	Pesticides/ PCB's	Total Metals
070GW00102	26467.07	Water	X	X		X
070GW00202	26467.09	Water	X	X		X
070GW01D02	26467.08	Water	X	X		X
539GW00102	26467.11	Water	X	X		X
539GW01D02	26467.13	Water	X	X		X
549GW00302	26467.10	Water	X	X		X
559GW00102	26436.07	Water	X	X		X
559GW00202	26436.08	Water	X	X		X
559GW00302	26467.05	Water	X	X		X
559GW00502	26467.12	Water	X	X		X
559GW00502DL	26467.12DL	Water	+			
559GW02D02	26436.09	Water	X	X		X
559GW03D02	26467.06	Water	X	X		X
GDEGW01402	26436.01	Water	X	X	X	X
GDEGW01602	26436.03	Water	X	X	X	X
GDEGW01702	26467.01	Water	X	X	X	X
GDEGW15D02	26436.02	Water	X	X	X	X
GDEGW17D02	26467.04	Water	X	X	X	X
559TW02D02	26436.10	Water	X			
559TW03D02	26467.14	Water	X			
GDEGW01702MS	26467.01MS	Water	+	+	+	+
GDEGW01702MD	26467.01MD	Water				+
GDEGW01702MSD	26467.01MSD	Water	+	+	+	

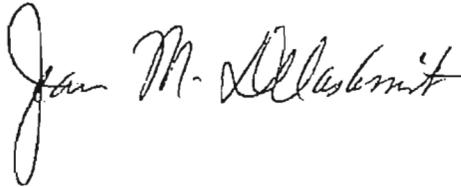
Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
025GW00202	26436.04	Water		X	X	X
025GW00302	26436.05	Water		X	X	X
025GW00402	26436.06	Water		X	X	X
070GW00102	26467.07	Water	X	X	X	X
070GW00202	26467.09	Water	X	X	X	X
070GW01D02	26467.08	Water	X	X	X	X
539GW00102	26467.11	Water		X	X	X
539GW01D02	26467.13	Water		X	X	X
549GW00302	26467.10	Water		X	X	X
559GW00102	26436.07	Water	X	X	X	X
559GW00202	26436.08	Water	X	X	X	X
559GW00302	26467.05	Water	X	X	X	X
559GW00502	26467.12	Water	X	X	X	X
559GW02D02	26436.09	Water	X	X	X	X
559GW03D02	26467.06	Water	X	X	X	X
GDEGW01402	26436.01	Water	X	X	X	X
GDEGW01602	26436.03	Water	X	X	X	X
GDEGW01702	26467.01	Water	X	X	X	X
GDEGW15D02	26436.02	Water	X	X	X	X
GDEGW17D02	26467.04	Water	X	X	X	X
GDEGW01702MS	26467.01MS	Water		+	+	
GDEGW01702MSD	26467.01MSD	Water		+	+	

+ = Non-billable analysis

DL = DILUTION, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE  
DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE:

A handwritten signature in black ink, reading "Jean M. Delashmit". The signature is written in a cursive style with a large initial "J" and "M".

### Data Qualifier Definitions

- J - The associated 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

Southwest Laboratory of Oklahoma, Inc. - 26436A Appendix IX, CLP Organics and Inorganics

SAMPLE: 559HW03D02

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 7/08/96 on instrument R for vinyl acetate (0.044), 2-chloroethyl vinyl ether (0.040), acrolein (0.047), acetonitrile (0.040), isobutyl alcohol (0.015), dichlorodifluoromethane (0.038) and 1,4-dioxane (0.004). The results for these compounds in associated sample 559HW03D02, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/08/96 on instrument R for the following compounds:

bromomethane	32.4%
acetone	35.0%
2-chloroethyl vinyl ether	41.8%
1,4-dioxane	45.9%

The non-detect results for 1,4-dioxane and 2-chloroethyl vinyl ether in the associated sample were previously rejected because of low RRF's in this calibration. Since the results for the other two compounds were non-detects, no further action was required.

##### Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for vinyl acetate (0.044), acrolein (0.037), acetonitrile (0.031), isobutyl alcohol (0.014) and 1,4-dioxane (0.001) in the standards analyzed on 8/06/96 at 11:05 on instrument R. The non-detect results for these compounds in the associated sample were previously flagged based on the initial calibration, so no further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 8/06/96 at 11:05 on instrument R for the following compounds:

1,4-dioxane	75.0%
acetone	33.6%
2-butanone	37.1%
1,1,2-trichloroethane	25.2%
trans-1,3-dichloropropene	25.9%
2-hexanone	26.9%
2-chloroethyl vinyl ether	35.0%
trans-1,4-dichloro-2-butene	28.0%
propionitrile	30.1%
methacrylonitrile	32.9%
methyl methacrylate	31.2%
ethyl methacrylate	28.0%
dichlorodifluoromethane	78.9%

The non-detect results for 1,4-dioxane, 2-chloroethyl vinyl ether and dichlorodifluoromethane in the associated sample were previously rejected because of low RRF's in the continuing calibration. The results for the other compounds in associated sample 559HW03D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

Chloroform was detected at 1.0 ug/L in method blank VBLK1. Since there were no positive results for this compound in the associated samples, no action was required.

##### Trip Blanks:

Methylene chloride and acetone were detected at 19.0 ug/L and 18.0 ug/L, respectively, in trip blank 559TW03D02, which was analyzed in SDG 26436B. The positive result for methylene chloride in the sample in this SDG, which was less than 10X the blank amount, was flagged as undetected (U) with the detection limits being raised to the level of contamination in the sample.

#### V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

#### VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. All criteria were met. No action was necessary.

#### VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for vinyl acetate, 2-chloroethyl vinyl ether, acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane in the SDG sample were rejected due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

III.) Calibration:

Initial Calibration:

The average Relative Response Factors (RRF's) for aramite (0.029) and hexachlorophene (0.048) were below the 0.050 QC limit for the standards analyzed on 8/08/96 on instrument A. The results for

these two compounds in associated sample 559HW03D02, which were non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 8/08/96 on instrument A for the following compounds:

m-cresol	35.1%
o-toluidine	30.3%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	29.9%
hexachloropropene	40.6%
p-phenylenediamine	38.1%
1,2,4,5-tetrachlorobenzene	38.1%
safrole	33.6%
1,4-naphthaquinone	33.6%
1,3-dinitrobenzene	34.7%
pentachlorobenzene	36.1%
1-naphthylamine	35.9%
4-nitroquinoline-1-oxide	39.6%
2-naphthylamine	33.8%
diphenylamine	31.6%
sulfotepp	35.8%
1,3,5-trinitrobenzene	31.9%
4-aminobiphenyl	30.3%
pronamide	33.9%
pentachloronitrobenzene	47.1%
disulfoton	39.9%
methyl parathion	36.1%
parathion	39.1%
methapyrilene	41.2%
isodrin	34.9%
3,3'-dimethylbenzidine	33.9%
kepone	32.0%
famphur	58.5%
2-acetylaminofluorene	30.4%
7,12-dimethylbenz(a)anthracene	47.9%

No action was required for these compounds in the associated sample, which consisted entirely of non-detects.

#### Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/08/96 at 07:36 on instrument A for the following compounds:

methyl methanesulfonate	42.5%
ethyl methanesulfonate	46.2%
2-picoline	43.3%
acetophenone	62.5%

n-nitrosopyrrolidine	32.4%
n-nitrosomorpholine	39.3%
o-toluidine	47.1%
n-nitroso-piperidine	59.9%
o,o,o-triethyl phosphorothionate	82.4%
n-nitroso-di-n-butylamine	56.1%
safrole	72.8%
isosafrole	62.0%
1,4-naphthoquinone	73.3%
1,3-dinitrobenzene	60.9%
1-naphthylamine	49.9%
2-naphthylamine	46.4%
thionazin	98.4%
phorate	47.7%
phenacetin	74.6%
diallate	40.9%
dimethoate	59.8%
4-aminobiphenyl	60.7%
pronamide	29.5%
pentachloronitrobenzene	89.1%
disulfoton	49.3%
methyl parathion	92.0%
parathion	113%
methapyrilene	79.4%
isodrin	84.2%
aramite	53.4%
chlorobenzilate	77.9%
3,3'-dimethylbenzidine	97.3%
famphur	181%
pyridine	28.4%
m-cresol	55.8%
4-nitroquinoline-1-oxide	162%
diphenylamine	49.3%
sulfotepp	71.6%
kepone	116%
a,a-dimethylpenthylamine	28.8%
p-phenylenediamine	29.8%
hexachlorophene	25.7%
1,3,5-trinitrobenzene	100%

The results for these compounds in associated sample 559HW03D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

Bis(2-ethylhexyl)phthalate was detected at 4.0 ug/L in method blank SBLK1. The positive result for

this compound in associated sample 559HW03D02, which was less than 10X the blank amount, was flagged as undetected (U) with the result less than the CRQL being raised to the CRQL.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was analyzed with this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS recoveries was not required, so no action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD's):

All Internal Standards Performance criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

The non-detect results for aramite and hexachlorophene were rejected in all samples due to very low RRF's in the initial calibration. All other laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

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 required.

III.) Blanks:

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

<u>Blank Type/ ID</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>5X Conc.</u>
CCB2	antimony	3.40 ug/L	17.0 ug/L
CCB4	calcium	49.3 ug/L	246 ug/L
CCB1	chromium	1.00 ug/L	5.00 ug/L
CCB1	copper	2.00 ug/L	10.0 ug/L
CCB2	lead	2.70 ug/L	13.5 ug/L
CCB4	manganese	0.80 ug/L	4.00 ug/L
CCB2	nickel	1.30 ug/L	6.50 ug/L
CCB3	thallium	4.30 ug/L	21.5 ug/L
CCB3	zinc	6.90 ug/L	34.5 ug/L

CCB = Continuing Calibration Blank

All results greater than the IDL but less than 5X the blank amounts (Action level, ug/L for water samples) for which the contaminated blank was an associated calibration blank were flagged as undetected (U).

Vanadium had a negative result (-0.60 ug/L) with the absolute value greater than the IDL. The associated non-detect sample result was flagged as estimated (UJ).

IV.) ICP Interference Check Sample Results:

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

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

antimony	3 ug/L
arsenic	5 ug/L
barium	2 ug/L
cadmium	1 ug/L
thallium	5 ug/L
vanadium	1 ug/L

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

Negative results were observed for chromium (- 3 ug/L) and copper (-14 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated sample at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

There were no Serial Dilution samples analyzed in this SDG. No action was taken.

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

There were no Duplicate Sample Analyses in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

There were no Matrix Spikes analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate sample 559HW03D02 was analyzed in this SDG while corresponding sample 559GW03D02 was analyzed in SDG 26436B. The calculable Relative Percent Differences (RPD's) for the field duplicate pair were:

<u>Analyte</u>	<u>559GW03D02, ug/L</u>	<u>559HW03D02, ug/L</u>	<u>RPD</u>
barium	33.1	32.8	0.9
calcium	73400	72100	1.8
iron	337	327	3.0
magnesium	17500	17300	1.1
manganese	134	133	0.7
potassium	6730	6540	2.9
sodium	128000	126000	1.6

No action was required, since all RPD's were within the 30% QC limit for water samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. 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:

All laboratory data were acceptable with qualifications.

*SULFATES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Sulfates were not detected in the method blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 0.6% for sulfates in field duplicate samples 559HW03D02 and 559GW03D02, analyzed in SDG 26436B. Since the RPD was within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections of chlorides in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed for this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 0.8% in field duplicate samples 559HW03D02 and 559GW03D02 (analyzed in SDG 26436B). Since the RPD was within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

There were no positive detections of TDS in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed for this SDG fraction. No action was required.

VI.) Field Duplicates:

The calculable Relative Percent Difference (RPD) was 1.5% for TDS in field duplicate samples 559HW03D02 and 559GW03D02 (analyzed in SDG 26436B). Since the RPD was within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

## DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26436 Level III, CLP Organics and Inorganics

SAMPLES: 025GW00202, 025GW00302, 025GW00402, 070GW00102, 070GW00202, 070GW01D02, 539GW00102, 539GW01D02, 549GW00302, 559GW00102, 559GW00202, 559GW00302, 559GW00502, 559GW00502DL, 559GW02D02, 559GW03D02, GDEGW01402, GDEGW01602, GDEGW01702, GDEGW01702MS, GDEGW01702MD, GDEGW01702MSD, GDEGW15D02, GDEGW17D02, 559TW02D02, 559TW03D02

### *VOLATILE ORGANICS*

#### I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

#### II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

#### III.) Calibration:

##### Initial Calibration:

The average Relative Response Factors (RRF's) for vinyl acetate (0.044) and 2-chloroethyl vinyl ether (0.040) were below the 0.050 QC limit for the standards analyzed on 7/08/96 on instrument R. The results for these compounds in all samples in this SDG, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 7/08/96 on instrument R for the following compounds:

bromomethane	32.4%
acetone	35.0%
2-chloroethyl vinyl ether	41.8%

The results for 2-chloroethyl vinyl ether in the associated samples were previously rejected because of a low RRF in this calibration. Since the results for the other compounds were non-detects, no further action was required.

##### Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.046) was below the 0.050 QC limit for the standards analyzed on 7/30/96 at 18:33 on instrument R. The results for this compound in the associated samples were previously rejected based on the initial calibration, so no further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/30/96 at 18:33 on instrument R for 2-butanone (25.4) and vinyl acetate (70.5%). The non-detect results for vinyl acetate in the associated samples were previously rejected based on the initial calibration. The results for 2-butanone in associated samples GDEGW01402, GDEGW15D02, GDEGW01602, 025GW00202, 025GW00302, 025GW00402, 559GW00102 and 559GW00202, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.032) was below the 0.050 QC limit for the standards analyzed on 7/31/96 at 12:16 on instrument R. The non-detect results for this compound in the associated samples were previously rejected based on the initial calibration, so no action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 7/31/96 at 12:16 on instrument R for the following compounds:

2-butanone	27.2%
vinyl acetate	61.4%
4-methyl-2-pentanone	27.0%
2-hexanone	27.9%

The non-detect result for vinyl acetate in the associated sample was previously rejected based on the initial calibration, so no action was required. The results for the other compounds in associated sample 559GW02D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 8/06/96 at 11:05 on instrument R for vinyl acetate (0.044). The associated non-detect sample results for this compound were previously rejected based on the initial calibration, so no further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 8/06/96 at 11:05 on instrument R for the following compounds:

acetone	33.6%
2-butanone	37.1%
1,1,2-trichloroethane	25.2%
trans-1,3-dichloropropene	25.9%
2-hexanone	26.9%
2-chloroethyl vinyl ether	35.0%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected based on the initial calibration, so no further action was required. All positive and non-detect results for the other compounds in associated samples GDEGW01702, GDEGW17D02, 559GW00302, 559GW03D02, 070GW00102, 070GW01D02, 070GW00202, 549GW00302, 559GW00502 and 539GW01D02 were flagged as estimated (J) and (UJ).

The Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 8/08/96 at 11:06 on instrument R for vinyl acetate (0.042). The associated non-detect sample results for this compound were previously rejected based on the initial calibration, so no further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 8/08/96 at 11:06 on instrument R for acetone (30.3%) and 2-chloroethyl vinyl ether (87.5%). The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected based on the initial calibration, so no further action was required. The result for acetone in associated sample 539GW00102, which was a non-detect, was flagged as estimated (UJ).

#### IV.) Blanks:

##### Method Blanks:

Methylene chloride and acetone were detected at 14.0 ug/L and 17.0 ug/L, respectively, in method blank VBLK1. All associated positive sample results for these two compounds less than 10X the blank amounts were flagged as undetected (U) with analytical results less than the CRQL being replaced with the CRQL. The associated samples were GDEGW01402, GDEGW15D02, GDEGW01602, 025GW00202, 025GW00302, 025GW00402, 559GW00102 and 559GW00202

Acetone was detected at 13.0 ug/L in method blank VBLK2. There were no positive results for this compound in the associated samples, so no action was required.

Chloroform was detected at 1.0 ug/L in method blank VBLK3. There were no positive results for this compound in the associated samples less than 5X the blank amount, so no action was taken.

Chloroform was detected at 1.0 ug/L in method blank VBLK4. There were no positive results for this compound in the associated samples, so no action was required.

##### Trip Blanks:

Methylene chloride and acetone were detected at 1.0 ug/L and 3.0 ug/L, respectively, in trip blank 559TW02D02. The results for these two compounds in the associated samples were previously flagged based on the method blanks. No further action was required.

Methylene chloride and acetone were detected at 19.0 ug/L and 18.0 ug/L, respectively, in trip blank 559TW03D02. All positive results for these compounds in associated samples 070GW00102, 070GW00202, 070GW01D02, 539GW01D02, 549GW00302, 559GW00302, 559GW00502, 559GW03D02, GDEGW01702 and GDEGW17D02 less than 10X the blank amount were flagged as undetected (U) with the detection limit being raised to the level of contamination in each sample.

#### V.) Surrogate Recoveries:

The Percent Recovery (%R) of 1,2-dichloroethane-d4 (116%) exceeded the 76-114% QC limits for sample 559GW00502. All positive results for this sample were flagged as estimated (J).

#### VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed with this SDG. Several Percent Recoveries (%R's) were outside the QC limits. Data validation action based on LCS criteria was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Internal Standards Performance (ISTD):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XII.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XIII.) System Performance:

All System Performance criteria were met. No action was taken.

XIV.) Overall Assessment of Data/General:

All non-detect results for vinyl acetate and 2-chloroethyl vinyl ether in the samples in this SDG were rejected (R) due to low RRF's in the initial calibration. The dilution result for chlorobenzene in sample 559GW00502DL was inserted by the validator into the data for sample 559GW00502 with the appropriate flag (D). All other laboratory data were acceptable with qualifications.

*SEMIVOLATILE ORGANICS*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was taken.

### III.) Calibration:

#### Initial Calibration:

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for the standards analyzed on 8/08/96 on instrument S for hexachlorocyclopentadiene (30.2%). Since there were no positive results for this compound in the associated samples, no action was necessary.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards run on 8/07/96 on instrument V for 1,2-dichlorobenzene (30.7%), 4-chlorophenyl-phenylether (31.2%) and 4,6-dinitro-2-methylphenol (31.8%). Since there were no positive results for these compounds in the associated samples, no action was necessary.

#### Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 8/05/96 at 05:45 on instrument V for the following compounds:

1,2-dichlorobenzene	29.4%
4-methylphenol	25.9%
hexachloroethane	30.2%
benzoic acid	37.6%
2,4-dinitrophenol	32.3%
3,3'-dichlorobenzidine	28.6%

All positive and non-detect results for these compounds in associated samples 025GW00202, GDEGW01402, GDEGW15D02 and GDEGW01602 were flagged as estimated (J) and (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 8/09/96 at 11:29 on instrument V for the following compounds:

4-methylphenol	30.6%
3,3'-dichlorobenzidine	26.0%
benzo(k)fluoranthene	28.2%

The results for this compound in associated sample 559GW00102, which consisted entirely of non-detects, were flagged as estimated (UJ).

### IV.) Blanks:

#### Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 3.0 ug/L in method blank SBLK1. All associated positive sample results for bis(2-ethylhexyl)phthalate less than 10X the blank amount were flagged as undetected (U) with the results less than the CRQL being replaced with the CRQL. The associated samples were GDEGW01402, GDEGW15D02, GDEGW01602, 025GW00202, 025GW00302, 025GW00402, 559GW00202, 559GW02D02 and 559GW00102.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2-fluorobiphenyl was below the 43-116% QC limits for sample 559GW00102 (42%). Only one surrogate was outside the QC limits, so no action was taken.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries were outside the QC limits. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 8/09/96 at 05:05 on the primary and secondary columns for the following compounds:

<u>Compound</u>	<u>Primary %D</u>	<u>Secondary %D</u>
alpha-BHC	37.0	30.0
beta-BHC	37.0	29.0
gamma-BHC	36.0	29.0
endrin	33.0	48.8
4,4'-DDT		38.0

The results for these compounds in associated samples GDEGW01402, GDEGW15D02, GDEGW01602, 025GW00202, 025GW00302 and 025GW00402, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 8/15/96 at 19:25 on the primary and secondary columns for the following compounds:

<u>Compound</u>	<u>Primary %D</u>	<u>Secondary %D</u>
alpha-BHC	30.0	36.0
beta-BHC	30.0	27.0
gamma-BHC	31.0	36.0
endrin	44.2	36.6
4,4'-DDT	28.0	

The results for these compounds in associated samples GDEGW01702 and GDEGW17D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 8/16/96 at 11:02 on the primary and secondary columns for the following compounds:

<u>Compound</u>	<u>Primary %D</u>	<u>Secondary %D</u>
alpha-BHC	39.0	36.0
beta-BHC	38.0	
gamma-BHC	39.0	33.0
endrin	58.4	34.0
4,4'-DDT	33.0	

V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2-fluorobiphenyl was below the 43-116% QC limits for sample 559GW00102 (42%). Only one surrogate was outside the QC limits, so no action was taken.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. Several Percent Recoveries were outside the QC limits. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD's):

All ISTD criteria were met. No action was required.

X.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was required.

XI.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no further action was taken.

XII.) Tentatively Identified Compounds (TIC's):

All TIC criteria were met, so no action was necessary.

XIII.) System Performance:

All System Performance criteria were met, so no action was taken.

XIV.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*PESTICIDES/PCB's*

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 8/09/96 at 05:05 on the primary and secondary columns for the following compounds:

<u>Compound</u>	<u>Primary %D</u>	<u>Secondary %D</u>
alpha-BHC	37.0	30.0
beta-BHC	37.0	29.0
gamma-BHC	36.0	29.0
endrin	33.0	48.8
4,4'-DDT		38.0

The results for these compounds in associated samples GDEGW01402, GDEGW15D02, GDEGW01602, 025GW00202, 025GW00302 and 025GW00402, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 8/15/96 at 19:25 on the primary and secondary columns for the following compounds:

<u>Compound</u>	<u>Primary %D</u>	<u>Secondary %D</u>
alpha-BHC	30.0	36.0
beta-BHC	30.0	27.0
gamma-BHC	31.0	36.0
endrin	44.2	36.6
4,4'-DDT	28.0	

The results for these compounds in associated samples GDEGW01702 and GDEGW17D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards run on 8/16/96 at 11:02 on the primary and secondary columns for the following compounds:

<u>Compound</u>	<u>Primary %D</u>	<u>Secondary %D</u>
alpha-BHC	39.0	36.0
beta-BHC	38.0	
gamma-BHC	39.0	33.0
endrin	58.4	34.0
4,4'-DDT	33.0	

All results for these compounds in the associated samples were previously qualified, so no further action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed with this SDG. All Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of gamma-chlordane were below the 40-137% QC limits for spiked samples GDEGW01702MS (35%) and GDEGW01702MSD (39%). The non-detect result for this compound in unspiked sample GDEGW01702 was flagged as estimated (UJ).

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

*TOTAL METALS AND CYANIDE*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and 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:

<u>Blank Type/ID#</u>	<u>Analyte</u>	<u>Max. Conc.</u>	<u>Action Level</u>
CCB1	aluminum	41.0 ug/L	205 ug/L
CCB2	antimony	3.40 ug/L	17.0 ug/L
ICB	barium	0.80 ug/L	4.00 ug/L
CCB4	calcium	49.3 ug/L	246 ug/L
PBW	chromium	2.24 ug/L	11.2 ug/L
CCB1	copper	2.00 ug/L	10.0 ug/L
CCB2	lead	2.70 ug/L	13.5 ug/L
CCB4	manganese	0.80 ug/L	4.00 ug/L
CCB2	nickel	1.30 ug/L	6.50 ug/L
CCB3	thallium	4.3 ug/L	21.5 ug/L
CCB3	zinc	6.90 ug/L	34.5 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,  
PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount (Action Level, ug/L for water 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:

<u>Blank ID</u>	<u>Analyte</u>	<u>Neg. Conc.</u>	<u>5X Conc.</u>
CCB1	cobalt	-1.10 ug/L	5.50 ug/L
CCB1	mercury	-0.10 ug/L	0.50 ug/L
CCB1	silver	-2.70 ug/L	13.5 ug/L
PBW	thallium	-2.70 ug/L	13.5 ug/L
CCB1	vanadium	-1.30 ug/L	6.50 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated positive sample results less than 5X the absolute value of the negative blank result and

all 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 detected in ICS Solution A at concentrations greater than the IDL:

antimony	3 ug/L
arsenic	5 ug/L
barium	2 ug/L
cadmium	1 ug/L
thallium	5 ug/L
vanadium	1 ug/L

These analytes should not be present. Additionally, negative results were observed for chromium (- 3 ug/L), cobalt (-1 ug/L), copper (-14 ug/L), lead (-2 ug/L), potassium (-224 ug/L) and silver (-2 ug/L) in ICS Solution A at absolute concentrations greater than the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

The Percent Differences (%D's) for barium (20.9%), calcium (40.7%), iron (87.8%), magnesium (35.3%) and manganese (50.3%) exceeded the 10 % QC limit. All positive results for these analytes in associated water samples 025GW00202, 025GW00302, 025GW00402, 559GW00102, 559GW00202, 559GW02D02, GDEGW01402, GDEGW15D02 and GDEGW01602 were flagged as estimated (J).

VI.) Laboratory Control Samples (LCS):

All LCS Recovery criteria were met. No action was required.

VII.) Duplicate Sample Analysis:

All Duplicate Sample Analysis criteria were met. No action was required.

VIII.) Matrix Spike Analysis (MS):

All MS analysis criteria were met. No action was necessary.

IX.) Field Duplicates:

Sample 559GW03D02 was analyzed in this SDG, while field duplicate sample 559HW03D02 was analyzed in SDG 26436A. The calculable Relative Percent Differences (RPD's) for the field duplicate pair were:

Analyte	559GW03D02, ug/L	559HW03D02, ug/L	RPD
barium	33.1	32.8	0.9
calcium	73400	72100	1.8
iron	337	327	3.0
magnesium	17500	17300	1.1
manganese	134	133	0.7
potassium	6730	6540	2.9
sodium	128000	126000	1.6

No action was required since all RPD's were within the 30% QC limit for water samples.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the samples in this SDG. No action was required.

XL.) 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:

All laboratory data were acceptable with qualifications.

*SULFATES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

Sulfates were not detected in the method blanks for this SDG. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates in field duplicate samples 559GW03D02 and 559HW03D02 (analyzed in SDG 26436A) was 0.6%. Since the RPD was within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*CHLORIDES*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

Chlorides were not detected in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD analysis criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 0.8% for chlorides in field duplicate samples 559GW03D02 and 559HW03D02 (analyzed in SDG 26436A). Since the RPD was within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

*TOTAL DISSOLVED SOLIDS (TDS)*

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

There were no positive detections of TDS in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

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

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was 1.5% for TDS in field duplicate samples 559GW03D02 and 559HW03D02 (analyzed in SDG 26436A). Since the RPD was within the 30% QC limit for water samples, no action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.