N61165.AR.003173
CNC CHARLESTON
5090.3a

DATA VALIDATION REPORT, 26475A, 26475B, CNC CHARLESTON SC
11/1/1997
VALIDATA CHEMICAL SERVICES, INC.

DRAFT ZONE E
RCRA FACILITY INVESTIGATION REPORT
NAVBASE CHARLESTON

VOLUME XIV OF XV
APPENDIX I (Part 3)

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

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:	0123
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
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:	26475A (Level IV) 26475B (Level III)

SAMPLES:

SDG 26475A:

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
GDEHW19D02	26491.01	Water	X

SDG 26475B:

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
549DW00202	26513.07	Water	+
549DW00202RE	26513.07RE	Water	X
549EW00202	26513.08	Water	X
549FW00202	26513.09	Water	X

+ = Non-billable Analysis

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK, RE = REANALYSIS

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE: Jean M. Delashmit

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26475A/B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: GDEHW19D02, 549DW00202, 549DW00202RE, 549EW00202, 549FW00202

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:

Method Blank	Compound	Conc. pg/L	Action Level pg/L
DFBLK1A	1234678-HpCDD	4.0	20
DFBLK1B	OCDD	14.7	74
DFBLK1B	123678-HxCDF	2.0	10
DFBLK1A	234678-HxCDF	2.8	14
DFBLK1A	OCDF	6.0	30

Detections of these compounds in associated sample GDEHW19D02 below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank 549DW00202, equipment rinsate blank 549EW00202 and field blank 549FW00202 collected on 8/1/96 were analyzed. in this SDG. Several 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

Field Blank	Compound	Conc. pg/L	Action Level pg/L
549EW00202	1234678-HpCDD	4.6	23
549EW00202	OCDD	22.6	113
549EW00202	123678-HxCDF	2.2	11
549FW00202	234678-HxCDF	2.2	11
549EW00202	OCDF	4.4	22

Detections of these compound in associated sample GDEHW19D02 below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD samples were analyzed. 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 laboratory data were acceptable with qualifications. Laboratory "X" and "B" flags were removed from the blank sample data 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:	0123
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	26475A (Appendix IX, Level IV) 26475B (Level III)

SAMPLES:

SDG 26403A (Level IV):

Client Sample#	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEHW19D02*	26491.14	Water	X	X	X	X

Client Sample#	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEHW19D02*	26491.14	Water	X	X	X	X

* = Corresponding sample GDEGW19D02 was analyzed in SDG 26403B.

HW = FIELD DUPLICATE

SDG 26475B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCBs	Total Metals
549GW00102	26513.05	Water	X	X		X
549GW00202	26513.06	Water	X	X		X
559GW00402	26490.03	Water	X	X		X
559GW04D02	26490.04	Water	X	X		X
563GW00302	26490.05	Water	X	X		X
GDEGW16D02	26475.01	Water	X	X	X	X
GDEGW01802	26475.02	Water	X	X	X	X
GDEGW18D02	26475.03	Water	X	X	X	X
GDEGW01902	26490.01	Water	X	X	X	X
GDEGW19D02*	26490.02	Water	X	X	X	X
GDEGW02002	26513.01	Water	X	X	X	X
GDEGW20D02	26513.02	Water	X	X	X	X
GDEGW02102	26513.03	Water	X	X	X	X
GDEGW21D02	26513.04	Water	X	X	X	X
549DW00202	26513.07	Water	X	X	X	X
549EW00202	26513.08	Water	X	X	X	X
549FW00202	26513.09	Water	X	X	X	X
549TW00102	26513.10	Water	X			
GDETW16D02	26475.04	Water	X			
GDETW19D02	26490.06	Water	X			
GDEGW19D02MS	26490.02MS	Water	+			
GDEGW19D02MSD	26490.02MSD	Water	+			
GDEGW02002MS	26513.01MS	Water	+			
GDEGW02002MSD	26513.01MSD	Water	+			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
549GW00102	26513.05	Water		X	X	X
549GW00202	26513.06	Water		X	X	X
559GW00402	26490.03	Water	X	X	X	X
559GW04D02	26490.04	Water	X	X	X	X
563GW00302	26490.05	Water		X	X	X
GDEGW16D02	26475.01	Water	X	X	X	X
GDEGW01802	26475.02	Water	X	X	X	X
GDEGW18D02	26475.03	Water	X	X	X	X
GDEGW01902	26490.01	Water	X	X	X	X
GDEGW19D02*	26490.02	Water	X	X	X	X
GDEGW02002	26513.01	Water	X	X	X	X
GDEGW20D02	26513.02	Water	X	X	X	X
GDEGW02102	26513.03	Water	X	X	X	X
GDEGW21D02	26513.04	Water	X	X	X	X
549DW00202	26513.07	Water	X	X	X	X
549EW00202	26513.08	Water	X	X	X	X
549FW00202	26513.09	Water	X	X	X	X

* = Corresponding field duplicate sample GDEHW19D02 was analyzed in SDG 26475A.
+ = Non-billable Quality Control Sample

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, F = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 26475A Appendix IX, CLP Organic and Inorganics

SAMPLE: GDEHW19D02

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
dichlorodifluoromethane	0.038

The non-detect results for these compounds in sample GDEHW19D02 were rejected (R). No further action was taken.

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 were previously rejected based on low RRF's in this calibration. Since there were no positive detections of the other compounds in the SDG sample, 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 8/9/96 at 13:24 on instrument R for the following compounds:

acetonitrile	0.032
acrolein	0.031
isobutyl alcohol	0.009
1,4-dioxane	0.001
vinyl acetate	0.013
dichlorodifluoromethane	0.027
2-chloroethyl vinyl ether	0.034

The non-detect results for all these compounds in sample GDEHW19D02 were previously rejected based on low RRF's in the initial calibration. No further action was necessary.

IV.) Blanks:

Method Blank:

Chloroform was detected at 2 ug/L in method blank VBLK. This compound was not detected in sample GDEHW19D02, so no action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Acetone and chlorobenzene were detected at 3 ug/L to 13 ug/L in all three field blanks. Since there were no positive detections of the two compounds in sample GDEHW19D02, 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 for this SDG. Two %R's exceeded 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 fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable 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 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, vinyl acetate, dichlorodifluoromethane, 2-chloroethyl vinyl ether and 1,4-dioxane were rejected in sample GDEHW19D02 because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualification.

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 sample GDEHW19D02 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 sample GDEHW19D02. No action was required.

Continuing Calibration:

The Relative Response Factor (RRF) for hexachlorophene (0.029) was below the 0.050 QC limit for the standard analyzed on 8/7/96 at 10:45 on instrument A. The non-detect result for this compound in sample GDEHW19D02 was previously rejected because of a low RRF in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/7/96 at 10:45 on instrument A for the following compounds:

hexachloropropene	46.6%
2,4-dinitrophenol	27.9%
4-nitrophenol	27.9%
pentachlorobenzene	50.1%
ethyl methanesulfonate	27.8%
methyl methanesulfonate	31.5%
n-nitrosodiethylamine	57.6%
2-picoline	33.6%
acetophenone	67.0%

n-nitrosopyrrolidine	44.5%
n-nitrosomorpholine	43.7%
n-nitroso-piperdine	54.6%
o-toluidine	47.7%
o,o,o-triethyl phosphorothioate	70.6%
safrole	72.3%
isosafrole	56.6%
n-nitrosodi-n-butylamine	60.3%
1,4-naphthoquinoline	79.3%
1,3-dinitrobenzene	71.6%
1-naphthylamine	42.3%
2-naphthylamine	37.4%
thionazin	48.3%
phenacetin	46.4%
diallate	38.8%
4-aminobiphenyl	53.8%
pronamide	37.7%
pentachloronitrobenzene	81.1%
disulfoton	30.0%
parathion	80.4%
methyl parathion	67.9%
isodrin	75.6%
aramite	79.8%
famphur	153%
m-cresol	41.3%
acetamidofluorine	33.7%
4-nitroquinoline-1-oxide	39.4%
diphenylamine	45.4%
kepone	122%
chlorobenzilate	43.9%
3,3'-dimethylbenzidine	76.3%
1,3,5-trinitrobenzene	99.6%
hexachlorophene	48.2%
n-nitrosodimethylamine	35.1%
pyridine	43.3%
7,12-dimethylbenz(a)anthracene	81.5%

The non-detect result for hexachlorophene in sample GDEHW19D02 was previously rejected because of a low RRF in the initial calibration. The results for the other compounds in this sample, 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, Equipment Rinsate and Field Blanks:

Bis(2-ethylhexyl)phthalate was detected at a range of 3 ug/L to 36 ug/L in the three field blanks, which were analyzed in SDG 26475B. The positive detection of bis(2-ethylhexyl)phthalate in sample GDEHW19D02, which was less than 10X the highest blank amount, was flagged as undetected (U) with the quantitation limit being raised to the level of sample contamination.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

No MS / MSD samples were analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the set 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 result for hexachlorophene was rejected in sample GDEHW19D02 because of a low RRF in the initial calibration. 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:

The Percent Differences (%D's) for alpha-BHC (41.0%), beta-BHC (38.0%), gamma-BHC (43.0%), endrin (36.6%) and 4,4'-DDT (31.0%) exceeded the 25% QC limit for PEM6F analyzed on 8/14/96 at 20:48 on the primary column. The non-detect results for these compounds in sample GDEHW19D02 were flagged as estimated (UJ).

The Percent Differences (%D's) for alpha-BHC (41.0%), beta-BHC (50.0%), gamma-BHC (39.0%) and endrin (34.6%) exceeded the 25% QC limit for PEM6F analyzed on 8/14/96 at 20:48 on the secondary column. The non-detect results for these compounds in sample GDEHW19D02 were previously qualified based on primary column results. No further action was necessary.

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was taken.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

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, which were analyzed in SDG 26475B. 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 fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the set 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 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 associated sample and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB4	antimony	3.70 ug/L	18.5 ug/L
FW	barium	0.59 ug/L	2.95 ug/L
DW	calcium	106 ug/L	530 ug/L
FW	cobalt	1.70 ug/L	8.50 ug/L
EW	copper	1.60 ug/L	8.00 ug/L
DW	iron	64.8 ug/L	324 ug/L
EW	manganese	1.10 ug/L	5.50 ug/L
EW	nickel	1.20 ug/L	6.00 ug/L
FW	silver	3.30 ug/L	16.5 ug/L
FW	vanadium	0.91 ug/L	4.55 ug/L
PBW	zinc	19.3 ug/L	96.5 ug/L

CCB = Continuing Calibration Blank, DW = Deionized Water Blank (549DW00202), EW = Equipment Rinsate Blank (549EW00202), FW = Field Blank (549FW00202), PBW = Preparation Blank (Water)

The deionized water, equipment rinsate and field blanks were analyzed in SDG 26475B. 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 deionized water, equipment rinsate, field blank, calibration or preparation blank were flagged as undetected (U).

A negative result with an absolute value greater than the IDL was found for copper (-1.00 ug/L) in the fourth continuing calibration blank. The non-detect result for copper in sample GDEHW19D02 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:

arsenic	3 ug/L
barium	4 ug/L
cadmium	1 ug/L
chromium	1 ug/L
lead	3 ug/L
manganese	1 ug/L
silver	4 ug/L
vanadium	3 ug/L

These analytes should not be present. Additionally, negative results were observed for copper (-3 ug/L) and thallium (-5 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 sample GDEHW19D02 was analyzed in this SDG while sample GDEGW19D02 was analyzed in SDG 26475B. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEHW19D02, ug/L	GDEGW19D02, ug/L	RPD
barium	12.0	12.2	1.7%
calcium	105000	108000	2.8%
magnesium	7470	7740	3.6%
manganese	53.1	54.5	2.6%
sodium	83700	84900	1.4%

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. 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.

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:

Chlorides were not detected in the method blank. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Chlorides were not detected in the three field blanks, analyzed in SDG 26475B. 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:

Field duplicate sample GDEHW19D02 was analyzed in this SDG while sample GDEGW19D02 was analyzed in SDG 26475B. The Relative Percent Difference (RPD) for chlorides in these field duplicates was 1.5%, which was 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.

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 Blank:

Sulfates were not detected in the method blank. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, analyzed in SDG 26475B. 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:

Sample GDEHW19D02 was analyzed in this SDG while sample GDEGW19D02 was analyzed in SDG 26475B. The Relative Percent Difference (RPD) for sulfates in these field duplicate samples was 12.4%, which was 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 Blank:

TDS was not detected in the method blank. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 14 mg/L in deionized water blank 549DW00202, which was analyzed in SDG 26475B. The positive result for TDS in sample GDEHW19D02 exceeded 5X the blank amount, so no action was required. There were no positive results for TDS in the two other field blanks (analyzed in SDG 26475). No further action was taken.

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:

Field duplicate sample GDEHW19D02 was analyzed in this SDG while sample GDEGW19D02 was analyzed in SDG 26475B. The Relative Percent Difference (RPD) for TDS in this set of field duplicates was 5.4%, which was 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: 549GW00102, 549GW00202, 559GW00402, 559GW04D02, 563GW00302, GDEGW16D02, GDEGW01802, GDEGW18D02, GDEGW01902, GDEGW19D02, GDEGW02002, GDEGW20D02, GDEGW02102, GDEGW21D02, 549DW00202, 549EW00202, 549FW00202, 549TW00102, GDETW16D02, GDETW19D02, GDEGW19D02MS, GDEGW19D02MSD, GDEGW0002MS, GDEGW02002MSD

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. All results for these compounds in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples and blanks were 559GW00402, 559GW04D02, 563GW00302, GDEGW16D02, GDETW16D02, GDEGW01802, GDEGW18D02, GDEGW01902, GDEGW19D02, GDETW19D02 and GDEGW02002.

The Percent Relative Standard Deviations (%RSD's) for bromomethane (32.4%), acetone (35.0%) 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 and acetone in the associated samples, so no further action was taken.

The Percent Relative Standard Deviations (%RSD's) for acetone (35.9%) and 2-chloroethyl vinyl ether (44.9%) exceeded the 30% QC limit for the standards analyzed on 8/12/96 on instrument R. Since there were no positive detections of the two compounds in the associated samples after blank qualification, no action was taken.

Continuing Calibration:

The Relative Response Factor (RRF) for vinyl acetate was 0.014 for the standard analyzed on 8/6/96 at

00:48 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) exceeded the 25% QC limit for the standards analyzed on 8/6/96 at 00:48 on instrument R for the following compounds:

acetone	32.2%
2-butanone	27.3%
4-methyl-2-pentanone	32.1%
2-hexanone	30.9%
vinyl acetate	68.2%
1,1,2,2-tetrachloroethane	26.8%
2-chloroethyl vinyl ether	95.0%

The non-detect results for vinyl acetate and 2-chloroethyl vinyl ether in the associated samples were previously rejected based on low RRF's in the initial calibration. The non-detect results for the other compounds in associated samples GDEGW16D02 and GDEGW01802 were flagged as estimated (UJ).

The Relative Response Factor for vinyl acetate was 0.042 for the standard analyzed on 8/8/96 at 11:06 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 required.

The Percent Differences (%D's) for acetone and 2-chloroethyl vinyl ether were 30.3% and 87.5%, respectively, for the standard analyzed on 8/8/96 at 11:06 on instrument R, which exceeded the 25% QC limit. The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected because of low RRF's in the initial calibration. The non-detect results for acetone in the associated samples were flagged as estimated (UJ). The associated samples were GDEGW18D02, GDEGW01902 and GDEGW19D02.

The Relative Response Factors for 2-chloroethyl vinyl ether (0.034) and vinyl acetate (0.013) in the standard analyzed on 8/9/96 at 13:24 on instrument R were below the 0.050 QC limit. The non-detect 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) of acetone and vinyl acetate were 26.9% and 70.5% for the standard analyzed on 8/9/96 at 13:24 on instrument R, which exceeded the 25% QC limit. The non-detect results for vinyl acetate in the associated samples were previously rejected because of a low RRF in the initial calibration. All results for acetone in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 559GW00402, 559GW04D02, 563GW00302 and GDEGW02002.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.028 for the standard analyzed on 8/13/96 at 12:26 on instrument R, which was below the 0.050 QC limit. The non-detect result for this compound in associated sample GDEGW02102 was rejected (R).

The Percent Difference (%D) for 2-chloroethyl vinyl ether was 45.1% for the standard analyzed on

8/13/96 at 12:26 on instrument R, which exceeded the 25% QC limit. The non-detect result for this compound in the associated sample was previously rejected based on a low RRF in this calibration. No further action was taken.

IV.) Blanks:

Method Blanks:

Methylene chloride was detected at 1 ug/L in method blank VBLK1. Methylene chloride was qualified based on the trip blanks. No further action was necessary.

Acetone was detected at 8 ug/L in method blank VBLK5. Acetone was qualified based on the deionized water blank. No further action was required.

Chloroform was detected at 1 ug/L, 2 ug/L and 2 ug/L, respectively, in method blanks VBLK2, VBLK4 and VBLK5. Chloroform was not detected in the associated samples. No action was taken.

Deionized Water Blank:

Acetone and chlorobenzene were detected at 13 ug/L and 3 ug/L, respectively, in deionized water blank 549DW00202. All positive results for acetone in the SDG samples, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL. All positive detections of chlorobenzene in the associated samples were greater than 5X the blank amount, so no further action was necessary.

Equipment Rinsate Blank:

Acetone and chlorobenzene were detected at 6 ug/L and 3 ug/L, respectively, in equipment rinsate blank 549EW00202. Acetone and chlorobenzene were qualified based on the deionized water blank. No further action was required.

Field Blank:

Acetone and chlorobenzene were detected at 8 ug/L and 3 ug/L, respectively, in field blank 549FW00202. These compounds were qualified based on the deionized water blank. No further action was required.

Trip Blanks:

Methylene chloride, acetone and chloroform were detected at 10 ug/L, 13 ug/L and 1 ug/L, respectively, in trip blank 549TW00102. The positive result for methylene chloride in sample GDEGW02102 was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRQL. The positive results for acetone were previously qualified based on the deionized water blank and there were no positive detections of chloroform in the associated samples. No further action was taken.

Methylene chloride was detected at 2 ug/L in trip blank GDETW16D02. The positive results for this compound in associated samples GDEGW16D02 and GDEGW01802 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 necessary.

VI.) Laboratory Control Samples (LCS):

Ten LCS's were analyzed with this SDG. Several %R's were outside the QC limits. Data validation action based on LCS recoveries were not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) was 12% for benzene in spiked samples GDEGW19D02MS and GDEGW19D02MSD, which exceeded the 11% QC limit. The positive result for benzene in unspiked sample GDEGW19D02 was flagged as estimated (J).

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the set 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:

The non-detect results for vinyl acetate were rejected in 11 sample and 2-chloroethyl vinyl ether was 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. 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 Deviations (%RSD's) of hexachlorocyclopentadiene (39.8%), 2,4-dinitrotoluene (34.2) and 2,6-dinitrotoluene (32.3%) exceeded the 30% QC limit for the standards analyzed on 8/13/96 on instrument S. There were no positive detections of these compounds in the associated samples. No action was taken.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 8/9/96 on instrument T for the following compounds:

1,2-dichlorobenzene	33.6%
diethylphthalate	33.5%
3,3'-dichlorobenzidine	34.1%
benzo(k)fluoranthene	46.2%

These compounds were not detected in the associated samples. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/9/96 at 11:29 on instrument V for the following compounds:

4-methylphenol	30.6%
benzo(k)fluoranthene	28.2%
3,3'-dichlorobenzidine	26.0%

All results for these compounds in associated samples GDEGW01802 and GDEGW18D02, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in both method blanks SBLK1 and SBLK2. This compound was qualified based on the field blank. No further action was necessary.

Deionized Water Blank:

Bis(2-ethylhexyl)phthalate was detected at 5 ug/L in deionized water blank 549DW00202. This compound was qualified based on the field blank. No further action was necessary.

Equipment Rinsate Blank:

Bis(2-ethylhexyl)phthalate and benzoic acid were detected at 3 ug/L and 2 ug/L, respectively, in equipment rinsate blank 549EW00202. Qualification of bis(2-ethylhexyl)phthalate was performed based on the field blank. All associated positive sample detections of benzoic acid less than 5X the blank amount were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL. The associated samples were 549GW00102, 549GW00202, 559GW00402, 559GW04D02, GDEGW16D02, GDEGW01802 and GDEGW02102.

Field Blank:

Bis(2-ethylhexyl)phthalate was detected at 6 ug/L in field blank 549FW00202. The positive detections of this compound in all SDG samples, 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.

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. All 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 of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the set 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 qualification.

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 (39.0%), beta-BHC (38.0%) and gamma-BHC (39.0%), endrin (58.4%) and 4,4'-DDT (33.0%) exceeded the 25% QC limit for PEM8E analyzed on 8/16/96 at 11:02 on the primary column. In addition, the %D's for alpha-BHC (36.0%), gamma-BHC (33.0%) and endrin (34.0%) exceeded the 25% QC limit for PEM8E on the secondary column. The non-detect results for these compounds in the associated samples were flagged as estimated (UJ). The associated samples were GDEGW16D02, GDEG18D02 and GDEGW01802.

The Percent Differences (%D's) for alpha-BHC (34.0%), beta-BHC (29.0%), gamma-BHC (28.0%) and endrin (29.6%) exceeded the 25% QC limit for PEM6O analyzed on 8/22/96 at 22:56 on the secondary column. In addition, the %D's for alpha-BHC (34.0%), gamma-BHC (31.0%) and endrin (28.0%) exceeded the 25% QC limit for PEM6O on the primary column. The non-detect results for these compounds in the associated samples were flagged as estimated (UJ). The associated samples were GDEGW01902 and GDEGW19D02.

The Percent Differences (%D's) for alpha-BHC (28.0%), beta-BHC (38.0%), gamma-BHC (27.0%) and endrin (28.2%) exceeded the 25% QC limit for PEM6E analyzed on 8/13/96 at 23:20 on the secondary column. The non-detect results for these compounds in the associated samples were flagged as estimated (UJ). The associated samples were GDEGW02002, GDEGW20D02, GDEGW02102 and GDEGW21D02.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 22.1% for 4,4'-DDT in the standard analyzed on the primary column on 8/16/96. Since only one compound exceeded the QC limit and was less than 30%, no action was necessary.

The Percent Relative Standard Deviation (%RSD) was 26.6% for endrin ketone in the standard analyzed on the secondary column on 8/22/96. Since only one compound exceeded the QC limit and was less than 30%, 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. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All Percent Recovery criteria were met. No action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analysis was not performed for this fraction in the SDG. 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 set 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:

Initial Calibration:

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

Continuing Calibration:

All Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB4	antimony	3.20 ug/L	16.0 ug/L
FW	barium	0.59 ug/L	2.95 ug/L
DW	calcium	106 ug/L	530 ug/L
CCB12	chromium	1.00 ug/L	5.00 ug/L
FW	cobalt	1.70 ug/L	8.50 ug/L
CCB12	copper	2.00 ug/L	10.0 ug/L
DW	iron	64.8 ug/L	324 ug/L
CCB13	lead	2.70 ug/L	13.5 ug/L
EW	manganese	1.10 ug/L	5.50 ug/L
CCB13	nickel	1.30 ug/L	6.50 ug/L
CCB2	selenium	3.20 ug/L	16.0 ug/L
FW	silver	3.30 ug/L	16.5 ug/L
CCB15	thallium	4.30 ug/L	21.5 ug/L
FW	vanadium	0.91 ug/L	4.55 ug/L
PBW	zinc	19.5 ug/L	97.5 ug/L

CCB = Continuing Calibration Blank, DW = Deionized Water Blank (549DW00202), EW = Equipment Rinsate Blank (549EW00202), FW = Field Blank (549FW00202), 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 deionized water, equipment rinsate, field blank, calibration or preparation blank were flagged as undetected (U).

Negative results with absolute values greater than the IDL was found for the following analytes:

Blank Type/ ID	Analyte	Neg. Conc.	5X Conc.
CCB4	copper	-1.00 ug/L	5.00 ug/L
CCB16	vanadium	-0.06 ug/L	0.30 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:

antimony	3 ug/L
arsenic	5 ug/L
barium	4 ug/L
cadmium	1 ug/L
chromium	1 ug/L
cobalt	1 ug/L
lead	3 ug/L
manganese	1 ug/L
silver	4 ug/L
thallium	5 ug/L
vanadium	3 ug/L

These analytes should not be present. Additionally, negative results were observed for copper (3 ug/L) and thallium (-5 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 fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

No Matrix Spike samples were analyzed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Sample GDEGW19D02 was analyzed in this SDG while field duplicate sample GDEHW19D02 was analyzed in SDG 26475A. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEHW19D02, ug/L	GDEGW19D02, ug/L	RPD
barium	12.0	12.2	1.7%
calcium	105000	108000	2.8%
magnesium	7470	7740	3.6%
manganese	53.1	54.5	2.6%
sodium	83700	84900	1.4%

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.

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.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections of chlorides 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 fraction of the SDG. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

Sample GDEGW19D02 was analyzed in this SDG while field duplicate sample GDEHW19D02 was analyzed in SDG 26475A. The Relative Percent Difference (RPD) for chlorides in these samples was 1.5%, which was 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.

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. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections of sulfates 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 fraction of the SDG. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

Sample GDEGW19D02 was analyzed in this SDG while field duplicate sample GDEHW19D02 was analyzed in SDG 26475A. The Relative Percent Difference (RPD) for sulfates in this set of field duplicates was 12.4%, which was within the 30% QC limit for water samples. 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:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 14 mg/L in deionized water blank 549DW00202. The positive results for TDS in all SDG samples exceeded 5X the blank amount, so no action was required. There were no positive detections of TDS in the two other field blanks. No action was taken.

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 of the SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

No MS / MSD samples were analyzed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

Sample GDEGW19D02 was analyzed in this SDG while field duplicate sample GDEHW19D02 was analyzed in SDG 26475A. The Relative Percent Difference (RPD) for TDS in the field duplicates was 5.4%, which was 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 Naval Base, Zone E
SERVICE ORDER NUMBER:	0127
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: 26573

SAMPLES:

SDG 26573A (Level IV):

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
054HW00202	26574.02	Water	X

SDG 26573B (Level III):

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
054DW00102	26587.01	Water	X
054EW00102	26587.02	Water	X
054FW00102	26587.03	Water	X

D =DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE: Jean M. Delashmit

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26573A/B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 054HW00202, 054DW00102, 054EW00102, 054FW00102

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:

Two 2,3,7,8-substituted PCDD's and PCDF's were detected in method blank at the following concentrations:

Method Blank	Compound	Conc. pg/L	Action Level pg/L
DFBLK1	OCDD	5.6	28
	234678-HxCDF	2.6	13

Detections of these compounds in associated sample 054HW00202 below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank 054DW00102, equipment rinsate blank 054EW00102 and field blank 054FW00102 collected on 8/9/96 were analyzed. Two 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

Field Blank	Compound	Conc. pg/L	Action Level pg/L
054DW00102	OCDD	18.8	94
054FW00102	OCDF	3.2	16

Detections of these compounds in the associated sample below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD samples were analyzed.

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.

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:	0127
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	26573A (Appendix IX, Level IV) 26573B (Level III)

SAMPLES:

SDG 26573A (Level IV):

Client Sample#	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Total Metals
054HW00202*	26574.02	Water	X		X
530HW01D02*	26574.01	Water	X	X	X

Client Sample#	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
054HW00202*	26574.02	Water	X	X	X
530HW01D02*	26574.01	Water	X	X	X

* = Corresponding field duplicate samples 054GW00202 and 530GW01D02 were analyzed in SDG 26573B.

HW = FIELD DUPLICATE

SDG 26573B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCBs	Total Metals
021GW00102	26573.08	Water	X			X
053GW00102	56587.07	Water				X
054GW00102	26587.04	Water	X			X
054GW00202*	26573.06	Water	X			X
054GW00302	26573.07	Water	X			X
525GW00102	26587.05	Water		X		X
530GW00102	26573.01	Water	X	X		X
530GW01D02*	26573.04	Water	X	X		X
530GW00202	26573.05	Water	X	X		X
530GW02D02	26587.06	Water	X	X		X
054DW00102	26587.01	Water	X	X	X	X
054EW00102	26587.02	Water	X	X	X	X
054FW00102	26587.03	Water	X	X	X	X
054TW00202	26573.09	Water	X			
530TW02D02	26587.08	Water	X			
054DW00102MS	26587.01MS	Water	+			
054DW00102MSD	26587.01MSD	Water	+			
530GW00102MS	26573.02MS	Water	+	+		
530GW00102MSD	26573.03MSD	Water	+	+		
530GW00102S	26573.02S	Water				+
530GW00102SD	26573.03SD	Water				+

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
021GW00102	26573.08	Water		X	X	X
053GW00102	26587.07	Water		X	X	X
054GW00102	26587.04	Water		X	X	X
054GW00202*	26573.06	Water		X	X	X
054GW00302	26573.07	Water		X	X	X
525GW00102	26587.05	Water		X	X	X
530GW00102	26573.01	Water		X	X	X
530GW01D02*	26573.04	Water		X	X	X
530GW00202	26573.05	Water		X	X	X
530GW02D02	26587.06	Water		X	X	X
054DW00102	26587.01	Water	X	X	X	X
054EW00102	26587.02	Water	X	X	X	X
054FW00102	26587.03	Water	X	X	X	X
530GW00102MS	26573.02MS	Water		+	+	
530GW00102MSD	26572.03MSD	Water		+	+	

* = Corresponding field duplicate samples 054HW00202 and 530HW01D02 were analyzed in SDG 26573A.

+ = Non-billable Analysis

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, S = MATRIX SPIKE, SD = MATRIX SPIKE DUPLICATE, TW = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 26573A Appendix IX, CLP Organic and Inorganics

SAMPLES: 054HW00202, 530HW01D02

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 8/12/96 on instrument R for the following compounds:

acrolein	0.025
acetonitrile	0.027
isobutyl alcohol	0.010
1,4-dioxane	0.002
dichlorodifluoromethane	0.044

The non-detect results for these compounds in samples 054HW00202 and 530HW01D02 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 8/12/96 on instrument R for the following compounds:

acetone	35.9%
2-chloroethyl vinyl ether	44.9%
1,4-dioxane	54.9%
isobutyl alcohol	43.7%
dichlorodifluoromethane	58.9%

The non-detect results for 1,4-dioxane, isobutyl alcohol and dichlorodifluoromethane were previously rejected based on low RRF's in this calibration. Since there were no positive detections of the other two 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 8/16/96 at 12:48 on instrument R for the following compounds:

acetonitrile	0.023
acrolein	0.038
isobutyl alcohol	0.008
1,4-dioxane	0.002
dichlorodifluoromethane	0.019
2-chloroethyl vinyl ether	0.020

The non-detect result for 2-chloroethyl vinyl ether in sample 530HW01D02 was rejected (R). The non-detect results for the other compounds were previously rejected based on low RRF's in the initial calibration. No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/16/96 at 12:48 on instrument R for the following compounds:

methylene chloride	27.4%
vinyl acetate	48.8%
2-chloroethyl vinyl ether	60.8%
acrolein	52.0%
dichlorodifluoromethane	56.8%

The results for 2-chloroethyl vinyl ether, acrolein and dichlorodifluoromethane in the associated sample were previously rejected due to very low RRF's in the initial calibration. The associated non-detect sample results for the other compounds were flagged as estimated (UJ). No further action was taken.

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 8/18/96 at 11:46 on instrument R for the following compounds:

acetonitrile	0.023
acrolein	0.035
isobutyl alcohol	0.007
1,4-dioxane	0.002
2-chloroethyl vinyl ether	0.023

The non-detect result for 2-chloroethyl vinyl ether in sample 054HW00202 was rejected (R). The non-detect results for the other compounds were previously rejected based on low RRF's in the initial calibration. No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/18/96 at 11:46 on instrument R for the following compounds:

methylene chloride	30.6%
acetone	26.4%
2-butanone	25.9%

vinyl acetate	56.0%
4-methyl-2-pentanone	31.1%
2-hexanone	34.5%
1,1,2,2-tetrachloroethane	29.0%
2-chloroethyl vinyl ether	54.9%
acrolein	40.0%
dichlorodifluoromethane	68.2%
isobutyl alcohol	30.0%
1,2-dibromo-3-chloropropane	27.2%

The results for 2-chloroethyl vinyl ether, acrolein, isobutyl alcohol and dichlorodifluoromethane in sample 054HW00202 were previously rejected due to very low RRF's in the initial and continuing calibrations. The non-detect results for the other compounds in the associated sample were flagged as estimated (UJ). No further action was taken.

IV.) Blanks:

Method Blank:

Methylene chloride and chloroform were both detected at 2 ug/L in method blank VBLK1. The deionized water blank was used for blank qualifications. No further action was taken.

Methylene chloride and chloroform were detected at 9 ug/L and 2 ug/L, respectively, in method blank VBLK2. The deionized water blank was used for blank qualifications. No further action was taken.

Deionized Water Blank:

Acetone (18 ug/L), methylene chloride (14 ug/L) and chlorobenzene (2 ug/L) were detected in deionized water blank 054DW00102, which was analyzed in SDG 26573B. The positive detections of acetone and methylene chloride in samples 054GW00202 and 530GW01D02, which were less than 10X the blank amounts, were flagged as undetected (U) with analytical results less than the CRQL being replaced with the CRQL. Chlorobenzene was not detected in the two samples. No further action was necessary.

Equipment Rinsate Blank:

Acetone (4 ug/L), methylene chloride (14 ug/L), chloroform (2 ug/L) and chlorobenzene (1 ug/L) were detected in equipment rinsate blank 054EW00102, which was analyzed in SDG 26573B. Acetone and methylene chloride were previously qualified using the deionized water blank. Chloroform and chlorobenzene were not detected in the associated samples. No further action was required.

Field Blank:

Acetone, methylene chloride and chlorobenzene were detected 21 ug/L, 5 ug/L and 2 ug/L, respectively, in field blank 054FW00102 (analyzed in SDG 26573B). Acetone and methylene chloride were previously qualified using the deionized water blank. Chlorobenzene in the associated samples. No further action was required.

Trip Blanks:

Methylene chloride was detected at 7 ug/L and 14 ug/L, respectively, in trip blanks 054TW00202 and 530TW02D02, which were analyzed in SDG 26573B. Methylene chloride was previously qualified using the deionized water blank. 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. 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 fraction of the SDG. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the two associated sets of field duplicate samples. 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, dichlorodifluoromethane, 2-chloroethyl vinyl ether and 1,4-dioxane were rejected in the two SDG 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. 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 (0.033) and hexachlorophene (0.048) in the standard analyzed on 08/26/96 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene in sample 530HW01D02 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for the initial calibration analyzed on 08/26/96 on instrument A exceeded the 30% QC limit for the following compounds:

m-cresol	35.1%
o-toluidine	31.0%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	60.0%
p-phenylenediamine	38.1%
safrole	39.3%
isosafrole	39.3%
1,4-naphthaquinone	36.8%
2,4-dinitrophenol	45.8%
1,3-dinitrobenzene	40.6%
1-naphthylamine	39.9%
4-nitroquioline-1-oxide	39.6%
2-naphthylamine	36.2%
thionazin	30.6%
diphenylamine	31.6%
sulfotepp	35.8%
1,3,5-trinitrobenzene	31.9%
diallate	34.8%
pronamide	40.0%
pentachloronitrobenzene	65.2%
2-sec-butyl-4,6-dinitrophenol	43.1%
methyl parathion	38.2%
parathion	44.3%
methapyrilene	44.3%
isodrin	34.9%
3,3-dimethylbenzidine	52.6%
kepone	32.0%

famphur	80.8%
7,12-dimethylbenz(a)anthracene	48.0%

These compounds were not detected in the associated sample, so no action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) for the standard analyzed on 8/26/96 at 11:57 were below the 0.050 QC limit for the following compounds:

aramite	0.039
hexachlorophene	0.019

The non-detect results for aramite and hexachlorophene were previously rejected in the associated sample based on low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 8/26/96 at 11:57 for the following compounds:

methyl methanesulfonate	44.6%
n-nitrosodiethylamine	44.1%
2-picoline	30.1%
acetophenone	44.6%
n-nitrosopyrrolidine	50.0%
n-nitrosomorpholine	33.6%
o-toluidine	52.0%
n-nitroso-piperidine	45.1%
o,o,o-triethyl phosphorothioate	41.0%
n-nitrosodi-n-butylamine	42.9%
safrole	69.7%
isosafrole	77.7%
1,4-naphthaquinone	55.0%
1,3-dinitrobenzene	60.4%
1-naphthylamine	61.9%
2-naphthylamine	55.8%
thionazin	39.4%
phenacetin	33.2%
diallate	61.0%
dimethoate	96.1%
4-aminobiphenyl	52.8%
pronamide	43.8%
pentachloronitrobenzene	136.3%
methyl parathion	46.0%
parathion	64.0%
methapyrilene	52.0%
aramite	30.6%
chlorobenzilate	38.3%
3,3-dimethylbenzidine	113.8%

pyridine	158.5%
4-nitroquioline-1-oxide	39.4%
diphenylamine	39.6%
sulfotepp	45.3%
kepone	66.4%
7,12-dimethylbenz(a)anthracene	99.2%
4-methylphenol	55.3%
p-phenylenediamine	33.6%
hexachlorophene	59.8%

The non-detect results for aramite and hexachlorophene in associated sample 530HW01D02 were previously rejected because of low RRF's in the initial calibration. All associated sample results for the other compounds, 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, Equipment Rinsate and Field Blanks:

Bis(2-ethylhexyl)phthalate was detected at 1 ug/L in both equipment rinsate blank 054EW00102 and field blank 054FW00102, which were analyzed in SDG 26573B. The positive detection of this compound in sample 530HW01D02, 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 positive detections in deionized water blank 054DW00102, which was analyzed in SDG 26573B. No further action was taken.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 116% for nitrobenzene-d5 in sample 530HW00102, which exceeded the 35-114% QC limits. Since only one surrogate was outside the QC limits in the base/neutral fraction, no action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. Several Recoveries exceeded 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):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the set of field duplicate 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 hexachlorophene and aramite were rejected in sample 530HW01D02 because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB4	aluminum	28.5 ug/L	143 ug/L
ICB	antimony	2.90 ug/L	14.5 ug/L
CCB4	arsenic	3.80 ug/L	19.0 ug/L
CCB4	barium	0.70 ug/L	3.50 ug/L
CCB4	calcium	17.9 ug/L	89.5 ug/L
CCB4	chromium	2.00 ug/L	10.0 ug/L
CCB4	cobalt	1.00 ug/L	5.00 ug/L
CCB4	copper	2.00 ug/L	10.0 ug/L
CCB4	nickel	1.40 ug/L	7.00 ug/L
CCB4	silver	4.20 ug/L	21.0 ug/L
CCB4	thallium	7.80 ug/L	39.0 ug/L
CCB4	tin	2.80 ug/L	14.0 ug/L
CCB4	vanadium	1.50 ug/L	7.50 ug/L
FW	zinc	5.50 ug/L	27.5 ug/L

FW = Field Blank (054FW00102), CCB = Continuing Calibration Blank,
ICB= Initial Calibration Blank

The field blank was analyzed in SDG 26573B. 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 field or calibration blank were flagged as undetected (U).

A negative result was observed for selenium (-3.30 ug/L) with an absolute value greater than the IDL in the initial calibration blank. The non-detect results for selenium in samples 054HW00202 and 530HW01D02 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	3 ug/L
barium	4 ug/L
cadmium	1 ug/L
chromium	2 ug/L
copper	4 ug/L
lead	2 ug/L
manganese	1 ug/L
nickel	1 ug/L
silver	2 ug/L
thallium	10 ug/L

These analytes should not be present. Additionally, negative results were observed for potassium (-1630 ug/L) and vanadium (-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 054HW00202 and 530HW01D02 were analyzed in this SDG while corresponding field duplicate samples 054GW00202 and 054GW01D02 were analyzed in SDG 26573B. The calculable Relative Percent Differences (RPD's) were:

Analyte	054HW00202, ug/L	054GW00202, ug/L	RPD
calcium	333000	330000	1.0
iron	31700	31500	0.6
lead	9.9	10.6	6.8
magnesium	116000	114000	1.7
manganese	641	633	1.3
potassium	51600	50400	2.4
sodium	709000	699000	1.4

Analyte	530HW01D02, ug/L	530GW01D02, ug/L	RPD
calcium	61100	62700	2.6
iron	173	181	4.5
magnesium	7690	7850	2.1
manganese	107	111	3.7
sodium	116000	117000	0.9

All RPD's were within the 30% QC limit for water samples in both field duplicate sample sets. No action was necessary.

X.) Graphite Furnace Atomic Absorption QC (GFAA):

Graphite Furnace analyses were not used for the sample 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.

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:

Chlorides were not detected in the method blank. No action was necessary.

Deionized Water Blanks:

Chlorides were detected at 5.8 mg/L in deionized water blank 054DW00102, which was analyzed in SDG 26573B. The detection of chlorides in the two associated samples exceeded 5X the blank amount. No action was taken.

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 SDG. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was taken.

VII.) Field Duplicates:

Samples 054HW00202 and 530HW01D02 were analyzed in this SDG while samples 054GW00202 and 530GW01D02 were analyzed in SDG 26573B. The Relative Percent Difference (RPD) for chlorides was 154% for field duplicate set 054HW00202 / 054GW00202, which exceeded the 30% QC limit for water samples. The positive results for chlorides in the two samples were flagged as estimated (J). The RPD for the second set was 0%, which was within the 30% QC limit for water samples. No further action was necessary.

VIII.) 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 Blank:

Sulfates were not detected in the method blank. No action was necessary.

Deionized Water Blank:

Sulfates were detected at 3.9 mg/L in deionized water blank 054DW00102, which was analyzed in SDG 26573B. The positive result for sulfates in sample 530HW01D02, which was less than 5X the blank amount, was flagged as undetected (U) with the detection limit being raised to the amount of contamination in the sample. The positive result in sample 054HW00202 exceeded 5X the blank amount. No further 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

Samples 054HW00202 and 530HW01D02 were analyzed in this SDG while samples 054GW00202 and 530GW01D02 were analyzed in SDG 26573B. The Relative Percent Difference (RPD) for sulfates in field duplicate set 054HW00202 / 054GW00202 was 1.1%, which was within the 30% QC limit for water samples. The RPD for the second set was not calculable. No further 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 Blank:

TDS was not detected in the method blank. No action was necessary.

Field Blank:

TDS was detected at 10 mg/L in field blank 054FW00102 which was analyzed in SDG 26573B. The positive result in sample 054HW00202 exceeded 5X the blank amount. TDS was not detected in sample 530HW01D02. 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

Samples 054HW00202 and 530HW01D02 were analyzed in this SDG while samples 054GW00202 and 530GW01D02 were analyzed in SDG 26573B. The Relative Percent Difference (RPD) for TDS in field duplicate set 054HW00202 / 054GW00202 was 3.5%, which was within the 30% QC limit for water samples. The RPD for the second set was not calculable. No further action was necessary.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26573B Level III, CLP Organics and Inorganics

SAMPLES: 021GW00102, 053GW00102, 054GW00102, 054GW00202, 054GW00302, 525GW00102, 530GW00102, 530GW01D02, 530GW00202, 530GW02D02, 054DW00102, 054EW0000102, 054FW00102, 054TW00202, 530TW02D02, 054DW00102MS, 054DW00102MSD, 530GW00102MS, 530GW00102MSD, 530GW00102S, 530GW00102SD, 530GW00102MD

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) for acetone (35.9%) and 2-chloroethyl vinyl ether (44.9%) exceeded the 30% QC limit for the standards analyzed on 8/12/96 on instrument R. There were no positive detections of these two compounds in the SDG samples. No action was taken.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.029 for the standard analyzed on 8/14/96 at 09:12 on instrument R, which was below the 0.050 QC limit. The non-detect results for this compound in the associated samples were rejected (R). The associated samples were 021GW00102, 054GW00202, 054GW00302, 530GW00102, 530GW01D02 and 054TW00202.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 8/14/96 at 09:12 on instrument R for the following compounds:

bromomethane	26.6%
2-chloroethyl vinyl ether	43.1%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected based on low a RRF in this calibration. The non-detect results for bromomethane in associated samples 021GW00102, 054GW00202, 054GW00302, 530GW00102 and 530GW01D02 were flagged as estimated (UJ).

The Relative Response Factor for 2-chloroethyl vinyl ether was 0.016 for the standard analyzed on 8/15/96 at 10:22 on instrument R, which was below the 0.050 QC limit. The non-detect result for this compound in associated sample 530GW00202 was rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 8/15/96 at 10:22 on instrument R for the following compounds:

methylene chloride	39.7%
vinyl acetate	40.3%
4-methyl-2-pentanone	31.1%
2-hexanone	32.0%
1,1,2,2-tetrachloroethane	25.7%
2-chloroethyl vinyl ether	68.6%

The non-detect result for 2-chloroethyl vinyl ether in associated sample 530GW00202 was previously rejected based on low a RRF in this calibration. The non-detect results for the other compounds in this sample were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.027 for the standard analyzed on 8/19/96 at 10:09 on instrument R, which was below the 0.050 QC limit. The non-detect results for this compound in the associated sample and blanks were rejected (R). The associated sample and blanks were 054GW00102, 054DW00102, 054EW00102 and 054TW02D02.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 8/19/96 at 10:09 on instrument R for the following compounds:

vinyl acetate	56.2%
4-methyl-2-pentanone	29.9%
2-hexanone	31.7%
1,1,2,2-tetrachloroethane	27.3%
2-chloroethyl vinyl ether	47.1%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected based on low a RRF in this calibration. The non-detect results for the other compounds in associated sample 054GW00102 were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.019 for the standard analyzed on 8/20/96 at 08:23 on instrument R, which was below the 0.050 QC limit. The non-detect result for this compound in associated sample 530GW02D02 and blank 054FW00102 were rejected (R).

The Percent Differences (%D's) for 2-chloroethyl vinyl ether (62.7%) and vinyl acetate (57.4%) exceeded the 25% QC limit for the standard analyzed on 8/20/96 at 08:23 on instrument R. The non-detect results for 2-chloroethyl vinyl ether in the associated sample was previously rejected based on a low RRF in this calibration. The non-detect result for vinyl acetate in sample 530GW02D02 was flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride was detected at 1 ug/L in method blank VBLK1. Methylene chloride was qualified based on the deionized water blank. No further action was necessary.

Methylene chloride, acetone and chloroform were detected at 14 ug/L, 12 ug/L and 2 ug/L, respectively, in method blank VBLK2. Methylene chloride and acetone were qualified based on the deionized water blank. Chloroform was not detected in the associated samples. No further action was required.

Methylene chloride and chloroform were detected at 15 ug/L and 2 ug/L, respectively, in method blank VBLK3. Methylene chloride was qualified based on the deionized water blank. Chloroform was not detected in the associated samples. No further action was required.

Methylene chloride and acetone were detected at 4 ug/L and 12 ug/L, respectively, in method blank VBLK4. Methylene chloride and acetone were qualified based on the deionized water blank. No further action was required.

Deionized Water Blank:

Acetone and methylene chloride were detected at 18 ug/L and 14 ug/L, respectively, in deionized water blank 054DW00102. All positive results for acetone and methylene chloride in the SDG samples, which were less than 10X the blank amounts, were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL.

Equipment Rinsate Blank:

Acetone and methylene chloride were detected at 10 ug/L and 13 ug/L, respectively, in equipment rinsate blank 054EW00201. Acetone and methylene chloride were previously qualified based on the deionized water blank. No further action was required.

Field Blank:

Acetone and methylene chloride were detected at 21 ug/L and 5 ug/L, respectively, in field blank 054FW00102. Acetone and methylene chloride were previously qualified based on the deionized water blank. No further action was required.

Trip Blanks:

Methylene chloride and acetone were detected at 7 ug/L and 9 ug/L, respectively, in trip blank 054TW00202. Methylene chloride was also detected at 14 ug/L in trip blank 530TW02D02. Acetone and methylene chloride were previously qualified based on the deionized water blank. No further action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Eight LCS's were analyzed with this SDG. One %R was outside the QC limits. Data validation action based on LCS recoveries were not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All criteria were met for the two sets of MS / MSD samples. 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):

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 were rejected in all SDG samples because of low RRF's in the continuing calibrations. 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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) for hexachlorocyclopentadiene was 26.1%, which exceeded the 25% QC limit for the standard analyzed on 8/21/96 at 10:59 on instrument J. All results for this compound in the SDG samples, 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 required.

Deionized Water Blank:

There were no positive detections in the deionized water blank. No action was necessary.

Equipment Rinsate and Field Blanks:

Bis(2-ethylhexyl)phthalate was detected at 1 ug/L in both equipment rinsate blank 054EW00102 and field blank 054FW00102. The detections of this compound in associated samples 525GW00102 and 530GW00202, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL.

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 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 for the set 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 qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Difference (%D) was 26.4% for endrin in PEM16Z, analyzed on 8/28/96 at 05:18 on the secondary column. Since the associated samples were field blanks, no action was taken.

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 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):

Two LCS's were analyzed in this SDG. One Percent Recovery was below QC limits. Data validation action based on LCS criteria was not required. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analysis was not performed for this fraction in the SDG. 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 field duplicate samples in this SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check sample data was not present in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC was not required for the samples in this SDG. No action was required.

XI.) 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	aluminum	198 ug/L	990 ug/L
ICB	antimony	2.90 ug/L	14.5 ug/L
CCB8	arsenic	3.80 ug/L	19.0 ug/L
ICB	barium	0.70 ug/L	3.50 ug/L
PBW	calcium	302 ug/L	1510 ug/L
CCB4	chromium	2.00 ug/L	10.0 ug/L
CCB4	cobalt	1.00 ug/L	5.00 ug/L
CCB4	copper	2.00 ug/L	10.0 ug/L
PBW	magnesium	72.0 ug/L	360 ug/L
CCB4	nickel	1.40 ug/L	7.00 ug/L
CCB4	silver	4.20 ug/L	21.0 ug/L
CCB4	thallium	7.80 ug/L	39.0 ug/L
CCB4	tin	2.80 ug/L	14.0 ug/L
CCB4	vanadium	1.50 ug/L	7.50 ug/L
FW	zinc	5.50 ug/L	27.5 ug/L

FW = Field Blank (054FW00102), 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 field, preparation or calibration blank were flagged as undetected (U).

Negative results with absolute values greater than the IDL were found for the following analytes:

Blank ID	Analyte	Neg. Conc.	5X Conc.
CCB8	barium	-0.70 ug/L	3.50 ug/L
CCB6	copper	-0.90 ug/L	4.50 ug/L
CCB8	cobalt	-1.20 ug/L	6.00 ug/L
CCB8	iron	-33.1 ug/L	166 ug/L
ICB	selenium	-3.30 ug/L	16.5 ug/L
CCB8	silver	-5.30 ug/L	26.5 ug/L
CCB8	vanadium	-1.60 ug/L	8.00 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank

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	3 ug/L
barium	4 ug/L
cadmium	1 ug/L
chromium	2 ug/L
copper	5 ug/L
lead	2 ug/L
manganese	1 ug/L
nickel	1 ug/L
selenium	3 ug/L
silver	2 ug/L
thallium	10 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 the following compounds in ICS Solution A at absolute values greater than the IDL:

cobalt	-1 ug/L
potassium	-1630 ug/L
silver	-2 ug/L
vanadium	-5 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:

All Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples 054GW00202 and 530GW01D02 were analyzed in this SDG while corresponding field duplicate samples 054HW00202 and 054HW01D02 were analyzed in SDG 26573A. The calculable Relative Percent Differences (RPD's) were:

Analyte	054HW00202, ug/L	054GW00202, ug/L	RPD
calcium	333000	330000	1.0
iron	31700	31500	0.6
lead	9.9	10.6	6.8
magnesium	116000	114000	1.7
manganese	641	633	1.3
potassium	51600	50400	2.4
sodium	709000	699000	1.4

Analyte	530HW01D02, ug/L	530GW01D02, ug/L	RPD
calcium	61100	62700	2.6
iron	173	181	4.5
magnesium	7690	7850	2.1
manganese	107	111	3.7
sodium	116000	117000	0.9

All RPD's for both field duplicate sample sets 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.

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 taken.

III.) Blanks:

Method Blanks:

Cyanide was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Cyanide was detected at 2.6 ug/L in field blank 054FW00102. Cyanide was not detected in the deionized water and equipment rinsate 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:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

Field duplicate samples were not analyzed for this fraction of the SDG. No action was necessary.

VIII.) 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.

Deionized Water Blanks:

Chlorides were detected at 5.8 mg/L in deionized water blank 054DW00102. The detections of chlorides in associated samples 525GW00102, 530GW00102 and 530GW00202, which were 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. No further 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 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 054GW00202 and 530GW01D02 were analyzed in this SDG while duplicate samples 054HW00202 and 530HW01D02 were analyzed in SDG 26573A. The Relative Percent Difference (RPD) for chlorides in field duplicate set 054HW00202 / 054GW00202 was 154%, which exceeded the 30% QC limit for water samples. The positive results for chlorides in the two samples were flagged as estimated (J). The RPD for the second set was 0%, which was within the 30% QC limit for water samples. No further action was necessary.

VIII.) 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. No action was necessary.

Deionized Water Blank:

Sulfates were detected at 3.9 mg/L in deionized water blank 054DW00102. The positive result for sulfates in samples 054GW00102, 054GW00302, 530GW00102, 530GW01D02 and 530GW02D02, which were less than 5X the blank amount, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample. No further 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 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 054GW00202 and 530GW01D02 were analyzed in this SDG while samples 054HW00202 and 530HW01D02 were analyzed in SDG 26573A. The Relative Percent Difference (RPD) for sulfates in field duplicate set 054HW00202 / 054GW00202 was 1.1%, which was within the 30% QC limit for water samples. The RPD for the second set was not calculable. No further action was necessary.

VIII.) 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:

TDS was not detected in the method blanks. No action was necessary.

Field Blank:

TDS was detected at 10 mg/L in field blank 054FW00102. The positive results for TDS in all SDG samples exceeded 5X the blank amount. 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

Samples 054GW00202 and 530GW01D02 were analyzed in this SDG while samples 054HW00202 and 530HW01D02 were analyzed in SDG 26573A. The Relative Percent Difference (RPD) for TDS in field duplicate set 054HW00202 / 054GW00202 was 3.5%, which was within the 30% QC limit for water samples. The RPD for the second set was not calculable. No further 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 Naval Base, Zone E
SERVICE ORDER NUMBER:	0128
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: 26598

SAMPLES:

SDG 26598A (Level IV):

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
065DW00102	26634.01	Water	X
065EW00102	26634.02	Water	X
065FW00102	26634.03	Water	X

SDG 26598B (Level III):

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
065GW00102	26633.01	Water	X
065GW00202	26613.01	Water	X
065GW00302	26633.03	Water	X
065GW00602	26633.07	Water	X
065GW00302MS	26633.04	Water	+
065GW00302MSD	26633.05	Water	+

+ = Non-billable Analysis

D =DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK
MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE: Jean M. Delashmit

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26598A/B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 065DW00102, 065EW00102, 065FW00102, 065GW00102, 065GW00202, 065GW00302, 065GW00602, 065GW00302MS, 065GW00302MSD

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:

Three 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following highest concentrations:

Method Blank	Compound	Conc. pg/L	Action Level pg/L
DFBLK1A	OCDD	7.3	37
	1234678-HpCDF	13.2	66
	OCDF	10.3	52

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank 065DW00102, equipment rinsate blank 065EW00102 and field blank 065FW00102 collected on 8/14/96 were analyzed. Four 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

Field Blank	Compound	Conc. pg/L	Action Level pg/L
065DW00102	OCDD	12.1	61
065DW00102	123678-HxCDF	1.7	8.5
065EW00102	1234678-HpCDF	7.2	36
065DW00102	OCDF	7.8	39

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

All criteria were met for MS/MSD set 065GW00302MS / 065GW00302MSD. No action was required.

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.

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:	0128
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, Chlorides, Sulfates, Total Dissolve Solids (TDS)
SDG NUMBERS:	26598A (Appendix IX, Level IV) 26598B (Level III)

SAMPLES:

SDG 26598A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-Volatiles	Pesticides/ PCB's	Total Metals
065DW00102	26634.01	Water	X	X	X	X
065EW00102	26634.02	Water	X	X	X	X
065FW00102	26634.03	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
065DW00102	26634.01	Water	X	X	X	X
065EW00102	26634.02	Water	X	X	X	X
065FW00102	26634.03	Water	X	X	X	X

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK

SDG 26598B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-Volatiles	Pesticides/ PCB's	Total Metals
023GW00102	26613.04	Water		X		X
023GW00102RE	26613.04RE	Water		+		
023GW01D02	26613.05	Water		X		X
023GW01D02RE	26613.05RE	Water		+		
065GW00102	26633.01	Water	X	X	X	X
065GW00202	26613.01	Water	X	X	X	X
065GW00202RE	26613.01RE	Water		+		
065GW00302	26633.03	Water	X	X	X	X
065GW00602	26633.07	Water	X	X	X	X
526GW00102	26613.02	Water	X	X	X	X
526GW00102RE	26613.02RE	Water		+		
526GW01D02	26613.03	Water	X	X		X
526GW00202	26633.02	Water	X	X		X
526GW00202RE	26633.02RE	Water		+		
528GW00102	26598.04	Water				X
550GW00102	26598.01	Water				X
065TW00102	26633.06	Water	X			
065TW00202	26613.06	Water	X			
065GW00202MS	26613.01MS	Water			+	
065GW00202MSD	26613.01MSD	Water			+	
065GW00302MS	26633.04MS	Water	+	+	+	
065GW00302MSD	26633.05MSD	Water	+	+	+	
065GW00302S	26633.04S	Water				+
065GW00302SD	26633.05SD	Water				+
550GW00102MS	26598.02S	Water				+
550GW00102MSD	26598.03SD	Water				+

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
023GW00102	26613.04	Water		X	X	X
023GW01D02	26613.05	Water		X	X	X
065GW00102	26633.01	Water	X	X	X	X
065GW00202	26613.01	Water	X	X	X	X
065GW00302	26633.03	Water	X	X	X	X
065GW00602	26633.07	Water	X	X	X	X
526GW00102	26613.02	Water		X	X	X
526GW01D02	26613.03	Water		X	X	X
526GW00202	26633.02	Water		X	X	X
528GW00102	26598.04	Water		X	X	X
550GW00102	26598.01	Water		X	X	X
065GW00302S	26633.04S	Water	+			
065GW00302SD	26633.05SD	Water	+			
550GW00102MS	26598.02MS	Water		+	+	+
550GW00102MSD	26598.03MSD	Water		+	+	+

+ = Non-billable analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, S = MATRIX SPIKE, SD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 26598A Appendix IX, CLP Organics and Inorganics

SAMPLES: 065DW00102, 065EW00102, 065FW00102

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 (0.018), acetonitrile (0.021), isobutyl alcohol (0.008), 1,4-dioxane (0.002), 2-chloroethyl vinyl ether (0.022) and dichlorodifluoromethane (0.022) were below the 0.050 QC limit for the initial calibration analyzed on 8/21/96 on instrument R. The non-detect results for these compounds in the three associated field blanks were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for acrolein (0.023), acetonitrile (0.028), isobutyl alcohol (0.014), 1,4-dioxane (0.002), 2-chloroethyl vinyl ether (0.029) and dichlorodifluoromethane (0.016) were below the 0.050 QC limit for standard analyzed on 8/21/96 at 18:01 on instrument R. The non-detect results for these compounds in the three associated field blanks were previously rejected due to very low RRF's in the initial calibration. No further action was taken.

IV.) Blanks:

Method Blanks:

Methylene chloride (6 ug/L) and acetone (8 ug/L) were detected in the method blank VBLK1. Since the three associated samples were field blanks, no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

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 necessary.

VIII.) Field Duplicates:

Field duplicates were not analyzed 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 non-detect results for 2-chloroethyl vinyl ether, acrolein, acetonitrile, 1,4-dioxane, isobutyl alcohol and dichlorodifluoromethane were rejected in the three SDG blank samples due to low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so 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 (0.031) and hexachlorophene (0.048) in the standards analyzed on 08/27/96 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene in the three associated field blank samples were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.036) and hexachlorophene (0.017) in the standard analyzed on 08/27/96 at 11:13 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene in the three associated field blank samples were previously rejected because of low RRF's in the initial calibration. No further action was necessary.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met, no action was required.

VI.) Laboratory Control Samples (LCS):

One LCS was 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 necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

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 necessary.

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 three SDG field blank samples because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Difference (%D) was 26.6% for endrin in PEM1C analyzed on 9/10/96 at 19:17 on the secondary column, which exceeded the 25% QC limit. Since the three associated samples were field blanks, no action was taken.

The Percent Difference (%D) was 31.4% for endrin in PEM1I analyzed on 9/10/96 at 05:56 on the secondary column, which exceeded the 25% QC limit. Since the three 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:

All 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:

The Percent Recoveries (%R's) of tetrachloro-m-xylene were 22% and 21%, respectively, on the primary and secondary columns, and 22% for decachlorobiphenyl on the primary column for blank 065EW00102, which were below the 30-150% QC limits. The associated sample was an equipment rinsate blank. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed by the laboratory. 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 necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. 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:

Florisil Cartridge Check data was not included in the data package. 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 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:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB3	antimony	5.50 ug/L	27.5 ug/L
PBW	barium	0.69 ug/L	3.45 ug/L
CCB2	cobalt	1.40 ug/L	7.00 ug/L
PBW	copper	1.56 ug/L	7.80 ug/L
PBW	silver	3.65 ug/L	18.3 ug/L
PBW	thallium	3.25 ug/L	16.3 ug/L
CCB4	vanadium	1.30 ug/L	6.50 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

Since the three SDG samples were field blanks, no action was taken.

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	6 ug/L
cadmium	1 ug/L
chromium	2 ug/L
cobalt	1 ug/L
copper	3 ug/L
lead	9 ug/L
manganese	1 ug/L
silver	5 ug/L
thallium	11 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium 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:

tin	-3 ug/L
vanadium	-1 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

ICP 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:

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples were not analyzed 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 without qualification.

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:

Chlorides were 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 Sample analysis was not performed for this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was necessary.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 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 for this SDG, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. 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:

There were no TDS detections 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 SDG. 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:

Field duplicate samples were not analyzed in this SDG. 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. - 26598B Level III, CLP Organics and Inorganics

SAMPLES: 023GW00102, 023GW00102RE, 023GW01D02, 023GW01D02RE, 065GW00102, 065GW00202, 065GW00202RE, 065GW00302, 065GW00602, 526GW00102, 526GW00102RE, 526GW01D02, 526GW00202, 526GW00202RE, 528GW00102, 550GW00102, 065TW00102, 065TW00202, 065GW00202MS, 065GW00202MSD, 065GW00302MS, 065GW00302MSD, 065GW00302S, 065GW00302SD, 550GW00102MS, 550GW00102MSD

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) of acetone (35.9%) and 2-chloroethyl vinyl ether (44.9%) exceeded the 30% QC limit for the standards analyzed on 08/12/96 on instrument R. Since there were no positive results for acetone and 2-chloroethyl vinyl ether in the SDG samples after blank qualifications, no action was taken.

The average Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.022, which was below the 0.050 QC limit for the standard analyzed on 8/21/96 on instrument R. The non-detect results for this compound in the associated samples were rejected (R). The associated samples were 065GW00202, 065GW00602, 526GW00102, 526GW00202, 065TW00102 and 065TW00202.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 8/21/96 on instrument R for the following compounds:

methylene chloride	66.6%
chloroethane	37.0%
acetone	76.8%
2-hexanone	29.2%
2-chloroethyl vinyl ether	45.2%

There were no positive results for these compounds in the associated samples after blank qualifications. No action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.019, which was below the 0.050 QC limit for the continuing calibration analyzed on 8/20/96 at 08:23 on instrument R. The non-detect result for this compound in associated samples 065GW00102, 065GW00302 and 526GW01D02 were rejected (R).

The Percent Differences (%D's) of vinyl acetate and 2-chloroethyl vinyl ether were 57.4% and 62.7%, respectively, which exceeded the 25% QC limit for the standard analyzed on 8/20/96 at 08:23 on instrument R. The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected due to a very low RRF in this calibration. The non-detect results for vinyl acetate in the associated samples were flagged as estimated (UJ). The associated samples were 065GW00102, 065GW00302 and 526GW01D02.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.029, which was below the 0.050 QC limit for the continuing calibration analyzed on 8/21/96 at 18:01 on instrument R. The non-detect result for this compound in the associated samples and blanks were previously rejected based on a low RRF in the initial calibration. The associated samples were 065GW00202, 065GW00602, 526GW00102 and 526GW00202 and blanks 065TW00102 and 065TW00202. No further action was taken.

The Percent Difference (%D) of methylene chloride and 2-chloroethyl vinyl ether were 31.4% and 31.8%. respectively, which exceeded the 25% QC limit for the standard analyzed on 8/21/96 at 18:01 on instrument R. The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected due to a very low RRF in the initial calibration. The non-detect results for methylene chloride in the associated samples after blank qualifications were flagged as estimated (UJ). The associated samples were 065GW00202, 065GW00602, 526GW00102, 526GW00202.

IV.) Blanks:

Method Blanks:

Acetone (12 ug/L) and methylene chloride (4 ug/L) were detected in method blank VBLK1. Acetone and methylene chloride were qualified using the deionized water blank. No further action was taken.

Acetone (8 ug/L) and methylene chloride (6 ug/L) were detected in method blank VBLK2. Acetone and methylene chloride were qualified using the deionized water blank. No further action was taken.

Deionized Water Blank:

Acetone (9 ug/L), methylene chloride (5 ug/L) and chlorobenzene (2 ug/L) were detected in deionized water blank 065DW00102, which was analyzed in SDG 26598A. The positive detection of acetone and methylene chloride in the associated SDG samples, which were 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. Chlorobenzene was not detected in the SDG samples. No further action was taken.

Equipment Rinsate Blank:

Acetone (14 ug/L), methylene chloride (4 ug/L) and chlorobenzene (2 ug/L) were detected in equipment rinsate blank 065EW00102, which was analyzed in SDG 26598A. These compounds were previously qualified using the deionized water blank. No further action was necessary.

Field Blank:

Acetone (5 ug/L), methylene chloride (5 ug/L), chloroform (2 ug/L) and chlorobenzene (2 ug/L) were detected in field blank 065FW00102, which was analyzed in SDG 26598A. Qualification of acetone, methylene chloride and chlorobenzene were previously performed using the deionized water blank. Chloroform was not detected in the SDG samples. No further action was necessary.

Trip Blanks:

Acetone (7 ug/L) and methylene chloride (8 ug/L) were detected in trip blank 065TW00102. These compounds were previously qualified using the deionized water blank. No further action was required.

Methylene chloride (4 ug/L) and carbon disulfide (3 ug/L) were detected in trip blank 065TW00202. Methylene chloride was previously qualified using the deionized water blank. The positive detections of carbon disulfide in associated samples 065GW00202 and 526GW00202, which were 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, so no action was required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this fraction of the SDG. All 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:

No field duplicate samples were analyzed 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 results for 2-chloroethyl vinyl ether were rejected in all SDG 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 taken.

III.) Calibration:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) of hexachlorocyclopentadiene was 35.9% which exceeded the 25% QC limit for the standard analyzed on 8/28/96 at 08:25 on instrument V. The results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 065GW00102, 065GW00302, 065GW00602 and 526GW01D02.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 26598A. No

action was taken.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of terphenyl-d14 was 30% in associated sample 065GW00302, which was below the 33-141% QC limits. Since only one surrogate in the base/neutral fraction was outside the QC limits with a %R greater than 10%, no action was required.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. Several Percent Recoveries were outside QC limits. Data validation action based on LCS criteria 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.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

IX.) Internal Standards Performance:

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:

All five reanalysis samples were extracted 11 days after the sampling date, which exceeded the 7 day QC limit. The samples were reextracted and reanalyzed because two compounds had %R's of less than 10% in the two associated LCS's.

The original analyses of samples 023GW00102, 023GW01D02, 065GW00202, 526GW00102 and

526GW00202 were considered by the validator to be of preferable data quality to the reanalyses because of their better holding times. The original analyses were selected for validation. 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 Difference (%D) was 31.4% for endrin, which exceeded the 25% QC limit for PEM1C analyzed on 9/10/96 at 19:17 on the secondary column. The non-detect results for this compound in associated samples 065GW00102, 065GW00302 and 065GW00602 were flagged as estimated (UJ).

III.) Calibration:

All Initial and 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 26598A. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All Recovery criteria were met. 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 065GW00302MS and 065GW00302MSD for the following compounds:

Compound	MS, %R	MSD, %R	QC Limits
4,4'-DDE	56	52	70-122%
4,4'-DDD	64	62	70-133%

The non-detect results for 4,4'-DDE and 4,4'-DDT in unspiked sample 065GW00302 were flagged as estimated (UJ). All MS / MSD criteria were met in the second set of MS / MSD's. No further action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS criteria were met. No action was taken.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check data was not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC was not required in this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data was 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:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	aluminum	198 ug/L	990 ug/L
CCB16	antimony	5.50 ug/L	27.5 ug/L
DW	arsenic	2.80 ug/L	14.0 ug/L
DW	barium	1.10 ug/L	5.50 ug/L
DW	beryllium	3.10 ug/L	15.5 ug/L
PBW	calcium	302 ug/L	1510 ug/L
PBW	chromium	1.06 ug/L	5.30 ug/L
DW	copper	2.30 ug/L	11.5 ug/L
CCB16	cobalt	1.40 ug/L	7.00 ug/L
DW	iron	48.0 ug/L	240 ug/L
PBW	nickel	1.37 ug/L	6.85 ug/L
FW	silver	3.70 ug/L	18.5 ug/L
FW	thallium	4.30 ug/L	21.5 ug/L
CCB16	vanadium	1.60 ug/L	8.00 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water),
DW = Deionized Water Blank (065DW00102), FW = Field Blank (065FW00102)

The deionized water and field blanks were analyzed in SDG 26598A. All results greater than the IDL but less than 5X the blank amount (Action Level) for which the contaminated blank was an associated calibration, preparation, deionized water or field blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL in the continuing calibration blank (CCB):

Blank ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	barium	-0.70 ug/L	3.50 ug/L
CCB3	cobalt	-1.20 ug/L	6.00 ug/L
CCB3	iron	-33.1 ug/L	66.2 ug/L
CCB3	silver	-5.30 ug/L	16.5 ug/L
CCB3	vanadium	-1.60 ug/L	8.00 ug/L

The associated sample results, which consisted entirely of non-detects after blank other 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:

antimony	6 ug/L
arsenic	3 ug/L
barium	4 ug/L
cadmium	1 ug/L
chromium	2 ug/L

copper	5 ug/L
lead	9 ug/L
manganese	1 ug/L
nickel	1 ug/L
silver	5 ug/L
selenium	3 ug/L
thallium	11 ug/L

These analytes should not be present. Additionally, negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

cobalt	-1 ug/L
silver	-3 ug/L
tin	-3 ug/L
vanadium	-5 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected in the samples at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) of magnesium was 11.1% in dilution sample 550GW00102L, which exceeded the 10% QC limit. Positive results for this analyte in associated samples 528GW00102 and 550GW00102 were flagged as estimated (J). All criteria were met in the dilution analysis of sample 065GW00302L. No further 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 in this SDG. No action was taken.

VIII.) Matrix Spike/ Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of magnesium were 64% and 71%, respectively, in spiked samples 550GW00102S and 550GW00102SD, which were below the 75-125% QC limits. The positive results for magnesium in associated samples 528GW00102 and 550GW00102 were flagged as estimated (J). All criteria were met in the second set of MS / MSD's. No further action was necessary.

IX.) Field Duplicates:

Field duplicates were not analyzed in this SDG. 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 Blanks:

There were no positive detections of chlorides in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 26598A. No action was taken.

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 for this SDG, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

The Percent Recoveries (%R's) of chlorides were 50% and 150%, respectively, in spiked samples

550GW00102MS and 550GW00102MSD, which were outside the 75-125% QC limits. In addition, the Relative Percent Difference (RPD) for the MS / MSD was 100%, which exceeded the 20% QC limit. The positive result in unspiked sample 550GW00102 was flagged as estimated (J).

VII.) Field Duplicates:

Field duplicates were not analyzed in this SDG. No action was necessary.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

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:

There were no positive detections of sulfates in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks (analyzed in SDG 26598A). No action was taken.

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 for this SDG, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. 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 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.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 10 mg/L in deionized water blank 065DW00102, which was analyzed in SDG 26598A. All positive detections of TDS in the SDG samples exceeded 5X the blank amount. No action was necessary. There were no positive detections in the equipment rinsate and field blanks, which were also analyzed in SDG 26598A. No action was taken.

IV.) Laboratory Check Samples (LCS):

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

V.) Duplicate Sample Analysis:

All Duplicate Sample criteria were met. 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:

Field duplicate samples were not analyzed in this SDG. 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:	0130
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: 26650

SAMPLES:

SDG 26650A (Level IV):

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
065HW00402	26651.01	Water	X

SDG 26650B (Level III):

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
065GW00402	26650.01	Water	X
065GW00502	26650.03	Water	X
065GW04D02	26650.02	Water	X

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26650A/B 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: 065HW00402, 065GW00402, 065GW00502, 065GW04D02

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:

Three 2,3,7,8-substituted PCDD's and PCDF's were detected in method blank at the following concentrations:

Method Blank	Compound	Conc. pg/L	Action Level pg/L
DFBLK	OCDD	7.0	35
	1234678-HpCDF	12.5	63
	OCDF	9.4	47

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Deionized water blank 065DW00102, equipment rinsate blank 065EW00102 and field blank 065FW00102 (collected on 8/14/96) were analyzed in SDG 26598. Four 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following highest concentrations:

Field Blank	Compound	Conc. pg/L	Action Level pg/L
065DW00102	OCDD	12.1	61
065DW00102	123678-HxCDF	1.7	8.5
065EW00102	1234678-HpCDF	7.2	36
065DW00102	OCDF	7.8	39

Detections of these compounds in the associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

MS/MSD set 065GW00302MS / 065GW00302MSD was analyzed in SDG 26598. All criteria were met, so no action was taken.

VII.) Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate sample set 065HW00402 / 065GW00402. No action was required.

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.

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:	0130
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	26650A (Appendix IX, Level IV) 26650B (Level III)

SAMPLES:

SDG 26650A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
065HW00402*	26651.01	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
065HW00402*	26651.01	Water	X	X	X	X

* = Field duplicate sample 065HW00402 was associated with sample 065GW00402 analyzed in SDG 26650B.

H = FIELD DUPLICATE

SDG 26650B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
065GW00402*	26650.01	Water	X	X	X	X
065GW04D02	26650.02	Water	X	X	X	X
065GW00502	26650.03	Water	X	X	X	X
065TW00402	26650.04	Water	X			
065GW00402MS	26650.01MS	Water	+			
065GW00402MSD	26650.01MSD	Water	+			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
065GW00402*	26650.01	Water	X	X	X	X
065GW04D02	26650.02	Water	X	X	X	X
065GW00502	26650.03	Water	X	X	X	X

* = Sample 065GW00402 was associated with field duplicate sample 065HW00402 analyzed in SDG 26650A.

\+ = Non-billable analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: [illegible]

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26650A Appendix IX, CLP Organics and Inorganics

SAMPLE: 065HW00402

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 8/21/96 on instrument R for 2-chloroethyl vinyl ether (0.022), acrolein (0.018), acetonitrile (0.021), isobutyl alcohol (0.008), dichlorodifluoromethane (0.022) and 1,4-dioxane (0.002). The results for these compounds in sample 065HW00402, 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 8/21/96 on instrument R for the following compounds:

chloroethane	37.0%
methylene chloride	66.6%
acetone	76.8%
2-chloroethyl vinyl ether	45.4%
dichlorodifluoromethane	47.0%
1,2-dibromo-3-chloropropane	44.5%

The results for 2-chloroethyl vinyl ether and dichlorodifluoromethane in the associated sample were previously rejected based on low RRF's in this calibration. Since the results for the other 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 2-chloroethyl vinyl ether

(0.029), acrolein (0.023), acetonitrile (0.028), isobutyl alcohol (0.014), 1,4-dioxane (0.002) and dichlorodifluoromethane (0.016) for the standards analyzed on 8/21/96 at 18:01 on instrument R. The results for these compounds in sample 065HW00402 were previously flagged based on the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 8/21/96 at 18:01 on instrument R for the following compounds:

2-chloroethyl vinyl ether	31.8%
acrolein	27.8%
acetonitrile	33.3%
isobutyl alcohol	75.0%
dichlorodifluoromethane	27.3%
methylene chloride	31.4%
trans-1,4-dichloro-2-butene	34.2%
acrylonitrile	29.4%
propionitrile	41.5%
methacrylonitrile	26.3%
methyl methacrylate	46.6%
ethyl methacrylate	30.8%
1,2-dibromoethane	26.7%
1,1,1,2-tetrachloroethane	31.2%
1,2,3-trichloropropane	49.6%
1,2-dibromo-3-chloropropane	27.3%

The results for 2-chloroethyl vinyl ether, acrolein, acetonitrile, isobutyl alcohol and dichlorodifluoromethane in the associated sample were previously rejected. The results for the other compounds in sample 0659HW00402, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride and acetone were detected at 6.0 ug/L and 8.0 ug/L, respectively, in method blank VBLK1. The positive result for methylene chloride in associated sample 065HW00402, which was less than 10X the blank amount, was flagged as undetected (U) with the analytical result being replaced with the CRQL. There was no positive result for acetone in the sample, so no further action was taken.

Trip Blank:

Methylene chloride was detected at 5.0 ug/L in trip blank 065TW00402 (analyzed in SDG 26650B). The result for this compound in the associated sample was previously flagged based on the method blank. No further 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 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. 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 2-chloroethyl vinyl ether, acrolein, acetonitrile, isobutyl alcohol, dichlorodifluoromethane and 1,4-dioxane in the sample 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) were below the 0.050 QC limit for the standards analyzed on 8/27/96 on instrument A for aramite (0.031) and hexachlorophene (0.048). The results for these compounds in associated sample 065HW00402, 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 8/27/96 on instrument A for the following compounds:

methyl methanesulfonate	33.3%
n-nitrosodiethylamine	32.1%
ethyl methanesulfonate	31.4%
acetophenone	35.9%
n-nitrosopyrrolidine	36.1%
m-cresol	35.1%
n-nitrosomorpholine	33.5%
o-toluidine	37.3%
n-nitroso-piperidine	35.0%
o,o,o-triethyl phosphorothionate	32.1%
a,a-dimethylphenethylamine	41.2%
2,6-dichlorophenol	31.3%
hexachloropropene	34.2%
p-phenylenediamine	38.1%
n-nitroso-di-n-butylamine	32.9%
1,2,4,5-tetrachlorobenzene	38.3%
safrole	30.1%
isosafrole	32.8%
1,4-naphthoquinone	35.5%
1,3-dinitrobenzene	35.1%
1-naphthylamine	37.9%
4-nitroquinoline-1-oxide	39.6%
2-naphthylamine	35.2%
thionazine	37.0%
diphenylamine	31.6%
sulfotepp	35.8%
1,3,5-trinitrobenzene	31.9%
phorate	36.4%
phenacetin	33.3%
diallate	35.0%
dimethoate	37.6%
4-aminobiphenyl	32.1%

pronamide	37.6%
pentachloronitrobenzene	45.3%
disulfoton	37.7%
methyl parathion	36.5%
parathion	37.5%
isodrin	35.3%
chlorobenzilate	39.3%
3,3'-dimethylbenzidine	43.6%
kepone	32.0%
famphur	70.1%
7,12-dimethylbenz(a)anthracene	48.0%
hexachlorophene	27.5%
pentachlorophenol	35.8%

Since 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 8/27/96 at 09:32 on instrument A for aramite (0.036) and hexachlorophene (0.017). The results for these compounds in the associated sample 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 standard analyzed on 8/27/96 at 09:32 on instrument A for the following compounds:

pyridine	50.1%
n-nitrosodimethylamine	46.1%
methyl methanesulfonate	48.5%
n-nitrosoethylmethylamine	25.2%
acetophenone	40.1%
o-toluidine	25.4%
1-nitroso-piperidine	44.3%
o,o,o-triethyl phosphorothionate	43.5%
n-nitroso-di-n-butylamine	69.4%
safrole	51.8%
1,4-naphthoquinone	30.0%
2,4-dinitrotoluene	39.9%
2-naphthylamine	46.9%
diallate	44.7%
4-aminobiphenyl	44.0%
pronamide	51.8%
pentachloronitrobenzene	98.7%
parathion	33.5%
isodrin	30.2%
3,3'-dimethylbenzidine	62.0%
famphur	76.5%
m-cresol	42.5%

4-nitroquinoline-1-oxide	156%
diphenylamine	80.6%
sulfotepp	47.0%
kepone	173%
7,12-dimethylbenz(a)anthracene	104%
4-methylphenol	42.2%
p-phenylenediamine	91.6%
hexachlorophene	65.9%

The non-detect result for hexachlorophene in the associated sample was previously rejected. The results for the other compounds in associated sample 065HW00402, 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. 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:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples associated with 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.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Difference (%D) exceeded the 25% QC limit for the PEM standard analyzed on 9/12/96 at 07:45 on the primary column for endrin (28.6%). The non-detect result for this compound in associated sample 065HW00402 was flagged as estimated (UJ).

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:

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):

MS / MSD analyses were not performed in this SDG. 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.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS 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 laboratory data were acceptable with 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 required.

III.) Blanks:

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

Blank ID	Analyte	Max. Conc.	Action Level
CCB3	antimony	5.50 ug/L	27.5 ug/L
PBW	barium	0.69 ug/L	3.45 ug/L
CCB2	cobalt	1.40 ug/L	7.00 ug/L
PBW	copper	1.56 ug/L	7.80 ug/L
PBW	silver	3.65 ug/L	18.2 ug/L
PBW	thallium	3.24 ug/L	16.2 ug/L
CCB4	vanadium	1.30 ug/L	6.50 ug/L
CCB3	cyanide	5.60 ug/L	28.0 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).

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	6 ug/L
cadmium	1 ug/L
chromium	2 ug/L
cobalt	1 ug/L
copper	3 ug/L
lead	9 ug/L
manganese	1 ug/L
silver	5 ug/L
thallium	11 ug/L

These analytes should not be present. Additionally, negative results were observed for tin (-3 ug/L) and vanadium (-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 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:

The calculable Relative Percent Differences (RPD's) for field duplicate samples 065HW00402 and 065GW00402 (analyzed in SDG 26650B) were:

Analyte	065GW00402, ug/L	065HW00402, ug/L	RPD
aluminum	133	119	11.1
barium	23.1	23.6	2.1
calcium	80400	81600	1.4
iron	559	554	0.9
magnesium	1650	1660	0.6
manganese	70.3	71.0	0.9
potassium	4180	4390	4.9
sodium	27300	27400	0.4
zinc	18.5	19.2	3.7

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 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):

No MS / MSD analyses were performed for this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 065HW00402 and 065GW00402 (analyzed in SDG 26650B) was 3.1%. 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:

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):

MS / MSD analyses were not performed in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 065HW00402 and 065GW00402,

(analyzed in SDG 26650B) was 2.4%. 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 in this SDG fraction. No action was required.

VI.) Field Duplicates:

The calculable Relative Percent Difference (RPD) for field duplicate samples 065HW00402 and 065GW00402, analyzed in SDG 26650B 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.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26650 Level III, CLP Organics and Inorganics

SAMPLES: 065GW00402, 065GW00402MS, 065GW00402MSD, 065GW04D02, 065GW00502, 065TW00402

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 (0.022) was below the 0.050 QC limit for the standards analyzed on 8/21/96 on instrument R. The results for this compound 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 8/21/96 on instrument R for the following compounds:

chloroethane	37.0%
methylene chloride	66.6%
acetone	76.8%
2-chloroethyl vinyl ether	45.4%

The non-detect results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. Since the results for the other compounds were non-detects after blank qualifications, no further 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 8/21/96 at 18:01 on instrument R. The associated 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 standard analyzed on 8/21/96 at 18:01 on instrument R for methylene chloride (31.4%) and 2-chloroethyl vinyl ether (31.8%). The non-detect

results for 2-chloroethyl vinyl ether in the associated samples were previously rejected based on the initial calibration, so no action was required. The results for methylene chloride in associated samples 065GW00402, 065GW04D02 and 065GW00502, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride and acetone were detected at 6.0 ug/L and 8.0 ug/L, respectively, in method blank VBLK1. All positive results for these compounds in associated samples 065GW00402, 065GW04D02 and 065GW00502 less than 10X the blank amounts were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL.

Trip Blank:

Methylene chloride was detected at 5.0 ug/L in trip blank 065TW00402. The results for this compound in the associated samples were previously flagged based on 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):

One LCS was analyzed with this SDG. All criteria were met. No action was required.

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 2-chloroethyl vinyl ether 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:

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 required.

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):

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 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 without qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

The Percent Difference (%D) for endrin (28.6%) exceeded the 25% QC limit for the PEM standard analyzed on 9/12/96 at 07:45. The results for this compound in associated samples 065GW00402, 065GW04D02 and 065GW00502, which consisted entirely of non-detects, were flagged as estimated (UJ).

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):

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 in 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 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:

Blank Type/ID	Analyte	Max. Conc.	5X Conc.
CCB3	antimony	5.50 ug/L	27.5 ug/L
PBW	barium	0.69 ug/L	3.45 ug/L
CCB2	cobalt	1.40 ug/L	7.00 ug/L
PBW	copper	1.56 ug/L	7.80 ug/L
PBW	silver	3.65 ug/L	18.2 ug/L
PBW	thallium	3.24 ug/L	16.2 ug/L
CCB4	vanadium	1.30 ug/L	6.50 ug/L
CCB3	cyanide	5.60 ug/L	28.0 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).

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	6 ug/L
cadmium	1 ug/L
chromium	2 ug/L
cobalt	1 ug/L
copper	3 ug/L
lead	9 ug/L
manganese	1 ug/L
silver	5 ug/L
thallium	11 ug/L

These analytes should not be present. Additionally, negative results were observed for tin (-3 ug/L) and vanadium (-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:

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 required.

VIII.) Matrix Spike Analysis (MS):

MS Analysis was not performed in this SDG. No action was taken.

IX.) Field Duplicates:

Sample 065GW00402 was analyzed in this SDG, while sample 065HW00402 was analyzed in SDG 26650A. The calculable Relative Percent Differences (RPD's) for the field duplicate pair were:

Analyte	065GW00402, ug/L	065HW00402, ug/L	RPD
aluminum	133	119	11.1
barium	23.1	23.6	2.1
calcium	80400	81600	1.4
iron	559	554	0.9
magnesium	1650	1660	0.6
manganese	70.3	71.0	0.9
potassium	4180	4390	4.9
sodium	27300	27400	0.4
zinc	18.5	19.2	3.7

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, 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:

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 in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates in field duplicate samples 065GW00402 and 065HW00402 (analyzed in SDG 26650A) was 3.1%. 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 in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides in field duplicate samples 065GW00402 and 065HW00402 (analyzed in SDG 26650A) was 2.4%. 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 in this SDG fraction. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS in field duplicate samples 065GW00402 and 065HW00402 (analyzed in SDG 26650A) 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.

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:	0137
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 NUMBER: 26815A (Level IV)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
GDE5002601	26882.02	Soil	X
GDE6002601	26882.01	Soil	X

5 = BENTONITE BLANK, 6 = SAND BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26815A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: GDE5002601, GDE6002601

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:

Two 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following concentrations:

Method Blank	Compound	Conc.	Action Level
DFBLK2	OCDD	0.81 ng/kg	4.5 ng/kg
	OCDF	0.83 ng/kg	5.5 ng/kg

Since the only samples in this SDG were blanks, no action was required.

Field Blanks:

Bentonite blank GDE5002601 and sand blank GDE6002601 collected on 9/10/96 were analyzed. Two 2,3,7,8-substituted PCDD's and PCDF's were detected in the blanks at the following concentrations:

Field Blank	Compound	Conc.	Action Level
GDE6002601	OCDD	1.4 ng/kg	7.0 ng/kg
GDE6002601	1234678-HpCDF	0.8 ng/kg	4.0 ng/kg

Since the only samples in this SDG were blanks, no action was required.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was taken.

VII.) Duplicates:

No field duplicate set was 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 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 #:	0137
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:	Water and Soil
TYPES OF ANALYSES:	Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Total Metals and Cyanide, Hexavalent Chromium
SDG NUMBER:	26815A (Level IV) 26815B (Level III)

SAMPLES:

SDG 26815A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDE5002601	26882.02	Soil	X	X	X	X
GDE6002601	26882.01	Soil	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Organophosphorus Pesticides	Chlorinated Herbicides
GDE5002601	26882.02	Soil	X	X
GDE6002601	26882.01	Soil	X	X

Client Sample #	Lab Sample #	Matrix	Hexavalent Chromium	Cyanide
GDE5002601	26882.02	Soil	X	X
GDE6002601	26882.01	Soil	X	X

5 = BENTONITE BLANK, 6 = SAND BLANK

SDG 26815B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Total Metals
065SB00701	26881.06	Soil		X	X
065SB00702	26881.07	Soil		X	X
065SB00702DL	26881.07DL	Soil		+	
065SB00801	26881.08	Soil		X	X
065SB00801RE	26881.08RE	Soil		+	
065SB00802	26881.09	Soil		X	X
531SB00401	26815.08	Soil		X	X
531SB00402	26815.09	Soil		X	X
GDESB02601	26815.06	Soil		X	X
GDESB02602	26815.07	Soil		X	X
GDESB02701	26815.05	Soil		X	X
GDESB02901	26815.01	Soil		X	X
GDESB02902	26815.02	Soil		X	X
GDESB03001	26815.03	Soil		X	X
GDESB03002	26815.04	Soil		X	X
GDESB02801	26881.04	Soil		X	X
GDESB02802	26881.05	Soil		X	X
065DB00701	26881.03	Water	X	X	X
065EB00701	26881.02	Water	X	X	X
GDET002601	26881.01	Water	X		

Client Sample #	Lab Sample #	Matrix	Pesticides/ PCBs	Cyanide
065DB00701	26881.03	Water	X	X
065EB00701	26881.02	Water	X	X

+ = Non-billable analysis

DB = DEIONIZED WATER BLANK, DL = DILUTION, EB = EQUIPMENT RINSATE BLANK, RE = REEXTRACTION / REANALYSIS, T = TRIP BLANK

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

RELEASE SIGNATURE:

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 26815A Appendix IX, CLP Organics and Inorganics

SAMPLES: GDE5002601, GDE6002601

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 2-chloroethyl vinyl ether (0.031), acrolein (0.040), acetonitrile (0.020), isobutyl alcohol (0.009) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the initial calibration analyzed on 9/16/96 on instrument I. The non-detect results for these compounds in the two associated blanks were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for 2-chloroethyl vinyl ether, acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane were below the 0.050 QC limit for standards analyzed on 9/18/96 at 11:32 and 9/19/96 at 12:39 on instrument I. The results for these compounds in the two associated blanks were previously rejected due to very low RRF's in the initial calibration. No further action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Equipment Rinsate and Deionized Water Blanks:

Chloroform was detected at 18 ug/L in both the equipment rinsate and deionized water blanks, which were analyzed in SDG 26815B. Since there were only blanks in this SDG, no action was taken.

Trip Blanks:

There were no positive detections in the trip blank, which was analyzed in SDG 26815B. No action was taken.

Bentonite Blank:

Methylene chloride (16 ug/kg) and acetone (17 ug/kg) were detected in the bentonite blank. Since there were only blanks in this SDG, no action was taken.

Sand Blank:

Methylene chloride (2 ug/kg) and acetone (5 ug/kg) were detected in the sand blank. Since there were only blanks in this SDG, no action was taken.

V.) Laboratory Control Samples (LCS):

All LCS criteria were met. No action was necessary.

VI.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not designated 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, acrolein, acetonitrile, 1,4-dioxane and isobutyl alcohol were rejected in the two blank samples in this SDG due to very low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so 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 (0.031) and hexachlorophene (0.048) in the standards analyzed on 09/04/96 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene in the two associated blank samples were rejected (R).

Continuing Calibration:

The average Relative Response Factors (RRF's) for aramite (0.045) and hexachlorophene (0.019) in the standards analyzed on 09/18/96 at 07:55 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene were previously rejected in the two associated blank samples based on low RRF's in the initial calibration. No further action was taken.

IV.) Blanks:

Method Blank:

Bis(2-ethylhexyl)phthalate was detected at 34 ug/kg in method blank SBLK1. Since only bentonite and sand blanks were associated with this blank, no action was required.

Equipment Rinsate and Deionized Water Blanks:

There were no positive detections in the equipment rinsate and deionized water blanks, which were analyzed in SDG 26815B. No action was taken.

Bentonite Blank:

Bis(2-ethylhexyl)phthalate was detected at 210 ug/kg in bentonite blank GDE5002601. Since there were no samples associated with this blank, no action was taken.

Sand Blank:

There were no positive detections in sand blank GDE6002601. No action was required.

V.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was necessary.

VI.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met, no action was required.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not designated in this SDG. No action was taken.

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 necessary.

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 two blank samples in this

SDG because of very low RRFs in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

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:

All 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.

Equipment Rinsate and Deionized Water Blanks:

There were no positive detections in the equipment rinsate and deionized water blanks, which were analyzed in SDG 26815B. No action was necessary.

Bentonite and Sand Blanks:

There were no positive detections in the bentonite and sand blanks. No action was taken.

V.) Laboratory Control Samples (LCS):

All LCS criteria were met. No action was necessary.

VI.) Surrogate Recoveries:

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

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples designated in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG. No action was taken.

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 laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All 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, so no action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Bentonite and Sand Blanks:

There were no positive detections in the bentonite and sand blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was taken.

VII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

Field duplicate samples were not designated in this SDG. No action was taken.

IX.) 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 Herbicides 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, so no action was necessary.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Field Blanks:

There were no positive detections in the bentonite and sand blanks. No action was required.

V.) Surrogate Recoveries:

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

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was taken.

VII.) TCL Compound Identification (HIS):

All HIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

Field duplicate samples were not designated in this SDG. No action was taken.

IX.) 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 and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
GDE5002601	aluminum	7200 mg/kg	36000 mg/kg
GDE5002601	antimony	0.52 mg/kg	2.60 mg/kg
GDE5002601	arsenic	4.70 mg/kg	23.5 mg/kg
GDE5002601	barium	258 mg/kg	1290 mg/kg
GDE5002601	beryllium	1.50 mg/kg	7.50 mg/kg
GDE5002601	cadmium	0.37 mg/kg	1.85 mg/kg
GDE5002601	calcium	9120 mg/kg	45600 mg/kg
GDE5002601	chromium	0.45 mg/kg	2.25 mg/kg
GDE5002601	cobalt	2.00 mg/kg	10.0 mg/kg
GDE5002601	copper	8.10 mg/kg	40.5 mg/kg
GDE5002601	iron	38500 mg/kg	192500 mg/kg
GDE5002601	lead	42.4 mg/kg	212 mg/kg
GDE5002601	magnesium	4810 mg/kg	24050 mg/kg
GDE5002601	manganese	991 mg/kg	4960 mg/kg
GDE5002601	nickel	5.70 mg/kg	28.5 mg/kg
GDE5002601	potassium	1140 mg/kg	5700 mg/kg
GDE5002601	sodium	13000 mg/kg	65000 mg/kg
GDE5002601	tin	3.50 mg/kg	17.5 mg/kg
GDE5002601	vanadium	2.60 mg/kg	13.0 mg/kg
GDE5002601	zinc	73.1 mg/kg	366 mg/kg

Since only sand blank GDE6002601 was associated with this bentonite blank, no action was taken.

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	4 ug/L
arsenic	4 ug/L
chromium	3 ug/L
lead	4 ug/L
nickel	2 ug/L

Since only bentonite and sand blanks were in this SDG, no action was taken.

V.) ICP Serial Dilution Analysis:

The 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:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

MS / MSD samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples were not 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 without qualification.

HEXAVALENT CHROMIUM

I.) Holding Times:

The holding times to analyses were 14 days for blanks GDE5002601 and GDE6002601, which exceeded the 24-hour QC limit. Since these samples were bentonite and sand blanks, no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

There were no positive detections in the method blanks, so no action was required.

IV.) Laboratory Check Samples (LCS):

All LCS criteria were met. No action was taken.

V.) Laboratory Duplicates (MD):

Laboratory Duplicate sample analysis was not performed in this SDG. No action was necessary.

VI.) Matrix Spike Recovery (MS):

MS sample analysis was not performed in this SDG. 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.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26815B Level III, CLP Organics and Inorganics

SAMPLES: 065SB00701, 065SB00702, 065SB00702DL, 065SB00801, 065SB00801RE, 065SB00802, 531SB00401, 531SB00402, GDESB02601, GDESB02602, GDESB02701, GDESB02901, GDESB02902, GDESB03001, GDESB03002, GDESB02801, GDESB02802, 065DB00701, 065EB00701, GDET002601

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 Factor (RRF) for 2-chloroethyl vinyl ether was 0.026 for the initial calibration analyzed on 9/13/96 on instrument N, which was below the 0.050 QC limit. The non-detect results for this compound in all SDG blanks were rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.024, which was below the 0.050 QC limit for the continuing calibration analyzed on 9/13/96 at 15:40 on instrument N. Since the associated non-detect results for this compound were previously rejected based on a very low RRF in the initial calibration, no further action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was required.

Equipment Rinsate and Deionized Water Blanks:

Chloroform was detected at 18 ug/L in both equipment rinsate blank 065EB00701 and deionized water blank 065DB00701. Since there were no samples associated with this blank in this SDG, no action was taken.

Trip Blanks:

There were no positive detections in the trip blank. No action was taken.

Bentonite Blank:

Methylene chloride (16 ug/kg) and acetone (17 ug/kg) were detected in bentonite blank GDE5002601, which was analyzed in SDG 26815A. Since only blanks were associated with this blank in this SDG, no action was taken.

Sand Blank:

Methylene chloride (2 ug/kg) and acetone (5 ug/kg) were detected in the sand blank GDE6002601 which was analyzed in SDG 26815A. Since only blanks were associated with this blank, no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD sample analyses were not performed in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples designated 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 results for 2-chloroethyl vinyl ether in the three blanks in this SDG were rejected (R) due to very low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

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 taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of hexachlorocyclopentadiene was 32.5% which exceeded the 30% QC limit for the standards analyzed on 9/17/96 on instrument P. Since there were no positive results for this compound in the associated samples, no action was required.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 9/20/96 on instrument V for the following compounds:

1,2-dichlorobenzene	31.9%
acenaphthylene	32.7%
diethylphthalate	35.0%
4-chlorophenyl-phenylether	33.6%
benzo(k)fluoranthene	30.8%

Since these compounds were not detected in the associated samples, no action was taken.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 30% QC limit for the standard analyzed on 9/12/96 at 07:50 on instrument T for the following compounds:

benzoic acid	25.6%
hexachlorocyclopentadiene	26.9%
2,4-dinitrophenol	39.5%

indeno(1,2,3-cd)pyrene	32.0%
benzo(g,h,i)perylene	29.9%

The positive and non-detect results for these compounds in the associated samples were flagged as estimated (J) and (UJ). The associated samples were GDESB02701, GDESB02901, GDESB02902, GDESB03001 and GDESB03002.

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 36 ug/kg in soil method blank SBLK3. Since the results for this compound were qualified based on the bentonite blank, no further action was required.

Field Blanks:

There were no positive detections in the equipment rinsate and deionized water blanks. No action was taken.

Bentonite Blank:

Bis(2-ethylhexyl)phthalate was detected at 210 ug/kg in bentonite blank GDE5002601, which was analyzed in SDG 26815A. Detections of bis(2-ethylhexyl)phthalate in all associated soil samples less than 10X the blank amount were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL.

Sand Blank:

There were no positive detections in sand blank GDE6002601, which was analyzed in SDG 26815A. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

All LCS 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.) Field Duplicates:

Field duplicate samples were not designated in this SDG. No action was required.

IX.) Internal Standards Performance:

The internal standard area counts for perylene-d12 were below the 50-200% QC limits for following samples:

Sample ID	Perylene-d12 (R%)
065SB00702	45%
065SB00702DL	46%
065SB00801	45%

The positive and non-detect results for compounds quantitated on this ISTD in the two 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):

The results for acenaphthene, fluorene, phenanthrene, fluoranthene and pyrene in sample 065SB00702 were above the instrument's linear range. The undiluted values were replaced with the diluted values for these compounds with appropriate flagging.

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 analysis of sample 065SB00801 was considered by the validator to be of preferable data quality compared to the re-extraction/reanalysis because of better surrogate recoveries. Both samples were analyzed within the required holding times. 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 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 taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in the equipment rinsate and deionized water blanks. No action was taken.

Bentonite and Sand Blanks:

There were no positive detections in the bentonite and sand blanks, which were analyzed in SDG 26815A. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed 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 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:

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 necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
GDE5002601	aluminum	7200 mg/kg	36000 mg/kg
GDE5002601	antimony	0.52 mg/kg	2.60 mg/kg
GDE5002601	arsenic	4.7 mg/kg	23.5 mg/kg
GDE5002601	barium	258 mg/kg	1290 mg/kg
GDE5002601	beryllium	1.50 mg/kg	7.50 mg/kg
GDE5002601	cadmium	0.37 mg/kg	1.85 mg/kg
GDE5002601	calcium	9120 mg/kg	45600 mg/kg
GDE5002601	chromium	0.45 mg/kg	2.25 mg/kg
GDE5002601	cobalt	2.00 mg/kg	10.0 mg/kg
GDE5002601	copper	8.10 mg/kg	40.5 mg/kg
GDE5002601	iron	38500 mg/kg	192500 mg/kg

Blank Type/ID#	Analyte	Max. Conc.	Action Level
GDE5002601	lead	42.4 mg/kg	212 mg/kg
GDE5002601	magnesium	4810 mg/kg	24050 mg/kg
GDE5002601	manganese	991 mg/kg	4955 mg/kg
GDE5002601	nickel	5.70 mg/kg	28.5 mg/kg
GDE5002601	potassium	1140 mg/kg	5700 mg/kg
CCB4	silver	2.60 ug/L	2.60 mg/kg
GDE5002601	sodium	13000 mg/kg	65000 mg/kg
PBS	thallium	0.388 mg/kg	1.94 mg/kg
GDE5002601	tin	3.50 mg/kg	17.5 mg/kg
GDE5002601	vanadium	2.60 mg/kg	13.0 mg/kg
GDE5002601	zinc	73.1 mg/kg	366 mg/kg
DW	cyanide	10.1 ug/L	10.1 mg/kg

GDE5002601 = Bentonite Blank, PBS = Preparation Blank (Soil),
CCB = Continuing Calibration Blank, DW = Deionized Water Blank (065DW00701)

The bentonite blank was analyzed in SDG 26815A. 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, bentonite, deionized water or preparation blank were flagged as undetected (U).

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

Blank ID#	Analyte	Neg. Conc.	5X Conc.
PBS	aluminum	-1.55 mg/kg	7.75 mg/kg
CCB2	chromium	-0.90 ug/L	0.90 mg/kg
CCB1	cobalt	-0.70 ug/L	0.70 mg/kg
CCB4	selenium	-3.50 ug/L	3.50 mg/kg
ICB2	thallium	-3.90 ug/kg	19.5 mg/kg
CCB7	vanadium	-0.70 ug/L	0.70 mg/kg

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

All associated positive and non-detect sample results less than 5X the absolute value of the negative blank results 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	6 ug/L
chromium	2 ug/L
lead	4 ug/L
nickel	2 ug/L
silver	4 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

ICP Serial Dilution Analysis was not performed. 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:

Matrix Spike Analysis was not performed in this SDG. No action was taken.

IX.) Field Duplicates:

Field duplicate samples were not 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:

High blank results in the associated bentonite blank caused many analytes to be qualified as undetected, which would otherwise have been positive results. 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:	0138
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:	26899A (Level IV)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
GDEE002801	26900.01	Water	X
GDE7002801	26900.02	Water	X
GDEP026D01	26940.01	Water	X

GDEE = EQUIPMENT BLANK, GDEP = POTABLE WATER BLANK

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma - 26899A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLES: GDEE002801, GDE7002801, GDEP026D01

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:

Two 2,3,7,8-substituted PCDD's and PCDF's were detected in method blanks at the following highest concentrations:

Method Blank	Compound	Conc.	Action Level
DFBLK1	OCDD	16.8 pg/L	85 pg/L
	OCDF	9.5 pg/L	48 pg/L

OCDF was not detected in the associated sample. The detection of OCDD in associated sample GDE7002801 below 5X the blank amount was designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

Equipment blank GDEE002801 and potable water blank GDEP026D01 collected on 9/11/96 and 9/13/96, respectively, were analyzed. OCDD was detected in the blanks at the following highest concentration:

Field Blank	Compound	Conc.	Action Level
GDEE002801	OCDD	11.2 pg/L	56 pg/L

The detection of OCDD in the associated sample was previously qualified using the method blank. No further action was required.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed. No action was taken.

VII.) Duplicates:

No field duplicate set was 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.

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:	0138
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 MATRICES:	Water and Soil
TYPES OF ANALYSES:	Volatile Organics, Semivolatile Organics, Pesticides/PCB's, Organophosphorus Pesticides, Chlorinated Herbicides, Total Metals and Cyanide, Hexavalent Chromium
SDG NUMBERS:	26899A (Level IV) 26899B (Level III)

SAMPLES:

SDG 26899A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEE002801	26900.01	Water	X	X	X	X
GDE7002801	26900.02	Water	X	X	X	X
GDEP026D01	26940.01	Water	X	X	X	X
023CB00401*	26919.01	Soil		X		X
570CB00401*	26919.02	Soil		X		X

Client Sample #	Lab Sample #	Matrix	Organophos. Pesticides	Chlorinated Herbicides
GDEE002801	26900.01	Water	X	X
GDE7002801	26900.02	Water	X	X
GDEP026D01	26940.01	Water	X	X

Client Sample #	Lab Sample #	Matrix	Chromium	Hexavalent Cyanide
GDEE002801	26900.01	Water	X	X
GDE7002801	26900.02	Water	X	X
GDEP026D01	26940.01	Water	X	X

* = Field duplicates were associated with samples 023SB00401 and 570SB00401 in SDG 26899B.

C = FIELD DUPLICATE, E = EQUIPMENT RINSATE BLANK, P = POTABLE WATER BLANK

SDG 26899B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Total Metals
023SB00401*	26918.01	Soil		X	X
023SB00402	26918.02	Soil		X	X
530SB01101	26918.05	Soil		X	X
530SB01102	26918.06	Soil		X	X
549SB01101	26918.03	Soil		X	X
549SB01102	26918.04	Soil		X	X
549SB01201	26918.07	Soil		X	X
549SB01202	26918.08	Soil		X	X
570SB00401*	26918.09	Soil		X	X
570SB00402	26918.10	Soil		X	X
570P000401	26918.13	Water	X	X	X
570T000401	26918.14	Water	X		
GDET002801	26899.01	Water	X		
GDET026D01	26941.01	Water	X		
570SB00402MS	26918.11	Soil		+	+
570SB00402MSD	26918.12	Soil		+	+

Client Sample #	Lab Sample #	Matrix	Pesticides/ PCB's	Cyanide
570P000401	26918.13	Water	X	X

+ = Non-billable Analysis
* = Samples were associated with field duplicate samples 023CB00401 and 570CB00401 in SDG 26899A.

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, E = EQUIPMENT RINSATE BLANK, P = POTABLE WATER BLANK, T = TRIP BLANK

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

RELEASE SIGNATURE:

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 26899A Appendix IX, CLP Organics and Inorganics

SAMPLES: GDEE002801, GDE7002801, GDEP026D01, 023CB00401, 570CB00401

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 2-chloroethyl vinyl ether (0.030), acetonitrile (0.026), isobutyl alcohol (0.010) and 1,4-dioxane (0.003) were below the 0.050 QC limit for the initial calibration analyzed on 9/12/96 on instrument R. The non-detect result for these compounds in associated blanks GDEE002801 and GDEP026D01 were rejected (R).

The Relative Response Factors (RRF's) for 2-chloroethyl vinyl ether (0.028), acetonitrile (0.029), isobutyl alcohol (0.010) and 1,4-dioxane (0.003) were below the 0.050 QC limit for the initial calibration analyzed on 9/17/96 on instrument R. The non-detect result for these compounds in associated sample GDE7002801 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 9/17/96 on instrument R for the following compounds:

2-chloroethyl vinyl ether	84.5%
trans-1,4-dichloro-2-butene	31.8%
dichlorodifluoromethane	46.8%

The non-detect result for 2-chloroethyl vinyl ether in the associated field blank was previously rejected due to very low RRF in this calibration. Since there were no positive results for other compounds in the associated sample, no action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) for 2-chloroethyl vinyl ether (0.011), acrolein (0.041), acetonitrile (0.024), isobutyl alcohol (0.009) and 1,4-dioxane (0.004) were below the 0.050 QC limit

for standard analyzed on 9/19/96 at 14:24 on instrument R. The non-detect result for acrolein in the associated field blank was rejected (R). The results for 2-chloroethyl vinyl ether, acetonitrile, isobutyl alcohol and 1,4-dioxane in the associated potable water blank GDEP026D01 were previously rejected due to very low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 9/19/96 at 14:24 on instrument R for the following compounds:

2-chloroethyl vinyl ether	60.7%
1,4-dioxane	33.3%

The result for 2-chloroethyl vinyl ether and 1,4-dioxane in associated blank were previously rejected due to very low RRF's in initial calibration. No further action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Equipment Rinsate Blank:

Chloroform was detected at 10 ug/L in equipment rinsate blank GDEE002801. Blank qualifications were performed using the potable water blank. No further action was necessary.

Trip Blanks:

Chloroform was detected at 2 ug/L in both trip blanks GDET002801 and 570T000401, which were analyzed in SDG 26899B. Blank qualifications were performed using the potable water blank. No further action was necessary.

Methylene chloride was detected at 8 ug/L in trip blank GDET026D01, which was analyzed in SDG 26899B. Since methylene chloride was not detected in associated sample GDE7002801, no action was required.

Potable Water Blanks:

Methylene chloride (12 ug/L), acetone (12 ug/L), chloroform (44 ug/L) and bromodichloromethane (8 ug/L) were detected in potable water blank GDEP026D01. Methylene chloride was not detected in the associated sample, no action was required. Detections of acetone and chloroform in associated sample GDE7002801 less than 5X the blank amounts 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, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was taken.

VIII.) Internal Standards Performance (ISTD):

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 taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

Acrolein was rejected in the potable water blank, and the non-detect results for 2-chloroethyl vinyl ether, acetonitrile, 1,4-dioxane and isobutyl alcohol were rejected in all samples and blanks in this SDG due to low RRF's in the initial and continuing calibrations. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so 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 (0.031) and hexachlorophene (0.048) for the standards analyzed on 09/04/96 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene in all associated samples and field blanks were rejected (R).

Continuing Calibration:

The average Relative Response Factors (RRF's) for aramite (0.045) and hexachlorophene (0.019) for the standards analyzed on 09/18/96 at 07:55 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene were previously rejected in associated sample GDE7002801 based on low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 9/18/96 at 07:55 for the following compounds:

2,2'-oxybis(1-chloropropane)	34.7%
2,6-dichlorophenol	63.5%
hexachloropropene	50.2%
1,2,4,5-tetrachlorobenzene	52.1%
2,4-dinitrophenol	38.6%
pentachlorobenzene	49.9%
n-nitrosomethylethylamine	28.6%
n-nitrosodiethylamine	91.3%
ethyl methanesulfonate	59.0%
2-picoline	53.7%
nitrobenzene	33.2%
acetophenone	75.6%
n-nitrosopyrrolidine	60.3%
n-nitrosomorpholine	54.9%
o-toluidine	58.5%
n-nitroso-piperidine	91.8%
o,o,o-triethyl phosphorothioate	84.8%
n-nitrosodi-n-butylamine	97.2%
safrole	100.6%
isosafrole	67.2%
2,6-dinitrotoluene	48.2%
1,4-naphthaquinone	86.6%
1,3-dinitrobenzene	127.9%
2,4-dinitrotoluene	60.1%
1-naphthylamine	62.4%
2-naphthylamine	68.6%
phenacetin	59.8%
diallate	106.1%
dimethoate	36.9%
4-aminobiphenyl	78.6%

pronamide	26.6%
pentachloronitrobenzene	126.0%
methyl parathion	110.7%
parathion	126.0%
methapyrilene	103.1%
isodrin	67.6%
aramite	43.1%
chlorobenzilate	35.6%
3,3-dimethylbenzidine	113.0%
famphur	151.2%
pyridine	158.5%
2-acetylaminofluorene	66.9%
thionazine	45.3%
4-methylphenol	42.9%
1,3,5-trinitrobenzene	63.1%
hexachlorophene	61.2%

The non-detect results for aramite and hexachlorophene in the associated sample were previously rejected based on low RRF's in the initial calibration. All results for the other compounds in associated sample GDE7002801, which consisted entirely of non-detects, were flagged as estimated (UJ).

The average Relative Response Factors (RRF's) for aramite (0.042) and hexachlorophene (0.017) for the standards analyzed on 09/23/96 at 08:50 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene were previously rejected in the associated samples based on low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 9/18/96 at 07:55 for the following compounds:

2,2'-oxybis(1-chloropropane)	31.3%
2,6-dichlorophenol	58.2%
hexachloropropene	39.4%
1,2,4,5-tetrachlorobenzene	31.0%
2,4-dinitrophenol	44.0%
pentachlorobenzene	40.7%
4,6-dinitro-2-methylphenol	26.9%
methyl methanesulfonate	39.2%
acetophenone	33.4%
n-nitrosopyrrolidine	53.4%
n-nitroso-piperidine	49.2%
o,o,o-triethyl phosphorothioate	39.2%
n-nitrosodi-n-butylamine	44.4%
safrole	64.3%
isosafrole	37.4%
1,4-naphthaquinone	68.7%
1,3-dinitrobenzene	79.2%
2-naphthylamine	26.5%

diallate	62.6%
4-aminobiphenyl	28.0%
pronamide	47.3%
pentachloronitrobenzene	93.4%
methyl parathion	50.3%
parathion	64.6%
isodrin	41.3%
aramite	33.1%
famphur	64.0%
m-cresol	31.5%
4-nitroquinoline-1-oxide	104.0%
diphenylamine	44.4%
kepone	148.0%
7,12-dimethylbenz(a)anthracene	119.7%
4-methylphenol	50.5%
p-phenylenediamine	29.4%
1,3,5-trinitrobenzene	67.1%
hexachlorophene	64.1%

The non-detect results for aramite and hexachlorophene in the associated samples were previously rejected based on low RRF's in the initial and continuing calibration. All results for the other compounds in the associated samples 023CB00401 and 570CB00401, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 7 ug/L in the water method blank SBLK1. Since this compound was not detected in associated sample GDE7002801, no action was taken.

Equipment Rinsate Blank:

There were no positive detections in equipment rinsate blank. No action was taken.

Potable Water Blank:

Di-n-butylphthalate (2 ug/L) and bis(2-ethylhexyl)phthalate (2 ug/L) were detected in potable water blank GDEP026D01. Detections of bis(2-ethylhexyl)phthalate in associated samples 023CB00401 and 570CB00401, which were less than 10X the blank amounts, were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL. The associated detections of di-n-butylphthalate were greater than 10X the blank amount, so no further action was required.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met, no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 023SB00401 and 570SB00401 were analyzed in this SDG, while duplicate samples 023CB00401 and 570SB00401 were analyzed in SDG 26899A. The calculable Relative Percent Differences (RPD's) were:

Compound	023SB00401	023CB00401	RPD
fluoranthene	1700 ug/kg	400 ug/kg	29%
pyrene	1800 ug/kg	400 ug/kg	36%

Compound	570SB00401	570CB00401	RPD
phenanthrene	1100 ug/kg	1000 ug/kg	10%
fluoranthene	1600 ug/kg	2200 ug/kg	32%
pyrene	1200 ug/kg	1400 ug/kg	15%
benzo(a)anthracene	640 ug/kg	830 ug/kg	26%
chrysene	800 ug/kg	920 ug/kg	14%
benzo(b)fluoranthene	820 ug/kg	1400 ug/kg	52%
benzo(k)fluoranthene	470 ug/kg	500 ug/kg	6%
benzo(a)pyrene	550 ug/kg	840 ug/kg	42%

Since all RPD's were within the 60% QC limit for soil samples, 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 necessary.

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.

XIV.) Overall Assessment of Data/General:

The ID number for sample 507CB00401 was incorrectly reported on the spreadsheets as "507CB0A401." This ID number was corrected on the spreadsheets by the validator to match the Chain-of-custody form. The electronic data file was not corrected.

The non-detect results for aramite, hexachlorophene were rejected in all samples associated with this SDG because of 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 necessary.

Continuing Calibration:

All 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.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was necessary.

Potable Water Blank:

There were no positive detections in the potable water blank. No action was taken.

V.) Surrogate Recoveries:

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

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the 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.) 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.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All 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, so no action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was required.

Potable Water Blank:

There were no positive detections in the potable water blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was taken.

VII.) TCL Compound Identification:

Organophosphorus Pesticide Identification Summary (OPIS):

All OPIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was taken.

IX.) 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 Herbicides 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, so no action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blank. No action was taken.

Equipment Rinsate Blank:

There were no positive detections in the equipment rinsate blank. No action was required.

Potable Water Blank:

There were no positive detections in the potable water blank. No action was required.

V.) Surrogate Recoveries:

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

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was taken.

VII.) TCL Compound Identification (HIS):

All HIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was taken.

IX.) 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 soil samples and were used for data qualification:

Blank/ID	Analyte	Max. Conc.	Action Level
PW	aluminum	134 ug/L	134 mg/kg
CCB1	antimony	4.80 ug/L	4.80 mg/kg
PW	barium	29.2 ug/L	29.2 mg/kg
PW	beryllium	0.30 ug/L	0.30 mg/kg
PW	calcium	18500 ug/L	18500 mg/kg
PW	chromium	1.30 ug/L	1.30 mg/kg
PW	cobalt	0.95 ug/L	0.95 mg/kg
PW	copper	2.50 ug/L	2.50 mg/kg
PW	iron	21500 ug/L	21500 mg/kg
PW	magnesium	1120 ug/L	1120 mg/kg
PW	manganese	337 ug/L	337 mg/kg
ERB	mercury	0.10 ug/L	0.10 mg/kg
PW	nickel	2.70 ug/L	2.70 mg/kg
ERB	silver	1.40 ug/L	1.40 mg/kg
PW	sodium	5720 ug/L	5720 mg/kg
CCB3	thallium	4.20 ug/L	4.20 mg/kg
PBS	tin	1.72 mg/kg	8.60 mg/kg
PW	vanadium	0.86 ug/L	0.86 mg/kg
ERB	cyanide	2.40 ug/L	2.40 mg/kg

CCB = Continuing Calibration Blank, ERB = Equipment Rinsate Blank (GDEE002801), PW = Potable Water Blank (GDEP026D01), 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, preparation, equipment rinsate or potable water blank were flagged as undetected (U).

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PW	aluminum	134 ug/L	670 ug/L
ERB	antimony	3.70 ug/L	18.5 ug/L
PW	barium	29.2 ug/L	146 ug/L
PW	beryllium	0.30 ug/L	1.50 ug/L
PW	calcium	18500 ug/L	92500 ug/L
PW	chromium	1.30 ug/L	6.50 ug/L
PW	cobalt	0.95 ug/L	4.75 ug/L
PW	copper	2.50 ug/L	12.5 ug/L
PW	iron	21500 ug/L	107500 ug/L
PW	magnesium	1120 ug/L	5600 ug/L
PW	manganese	337 ug/L	1685 ug/L
ERB	mercury	0.10 ug/L	0.50 ug/L
PW	nickel	2.70 ug/L	13.5 ug/L
ERB	silver	1.40 ug/L	7.00 ug/L
PW	sodium	5720 ug/L	28600 ug/L
CCB5	thallium	2.90 ug/L	14.5 ug/L
PBS	tin	1.72 mg/kg	8.60 ug/L
PW	vanadium	0.86 ug/L	4.30 ug/L
ERB	cyanide	2.40 ug/L	12.0 ug/L

CCB = Continuing Calibration Blank, ERB = Equipment rinsate Blank (GDEE002801), PW = Potable Water Blank (GDEP026D01), PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount (Action Level) for which the contaminated blank was an associated calibration, preparation, potable water or equipment rinsate blank were flagged as undetected (U).

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

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
ICB	aluminum	-13.0 ug/L	13.1 mg/kg
ICB	chromium	-0.90 ug/L	0.90 mg/kg
ICB	iron	-23.6 ug/L	23.6 mg/kg
ICB	silver	-4.00 ug/L	4.00 mg/kg
ICB	vanadium	-1.90 ug/L	1.90 mg/kg

ICB = Initial Calibration Blank

All associated positive soil sample results less than 5X the absolute value of the negative blank results and all associated non-detects soil sample results were flagged as estimated (J) and (UJ).

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

Blank ID	Analyte	Neg. Conc.	5X Conc.
PBW	aluminum	-22.6 ug/L	112.8 ug/L
PBW	antimony	-2.32 ug/L	11.6 ug/L
PBW	barium	-0.335 ug/L	1.68 ug/L
CCB4	chromium	-1.40 ug/L	7.00 ug/L
CCB4	nickel	-1.40 ug/L	4.00 ug/L
CCB7	selenium	-4.10 ug/L	20.5 ug/L
CCB5	silver	-3.80 ug/L	19.0 ug/L
CCB4	vanadium	-1.50 ug/L	7.50 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

The associated positive water sample results less than 5X the absolute value of the negative blank results and the associated non-detects water sample results 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	2 ug/L
selenium	6 ug/L
thallium	9 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium 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	-3 ug/L
silver	-3 ug/L
vanadium	-4 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

The ICP Serial Dilution analysis was not performed in this fraction of the 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 / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 023SB00401 and 570SB00401 were analyzed in SDG 26899B, while duplicate samples 023CB00401 and 570CB00401 were analyzed in this SDG. The calculable Relative Percent Differences (RPD's) were:

Analyte	023SB00401, mg/kg	023CB00401, mg/kg	RPD
aluminum	2560	6440	86%
antimony	7	7.4	6%
arsenic	2.9	3.4	16%
barium	23.6	24.9	5%
cadmium	1.8	8.9	133%
calcium	7420	10400	33%
chromium	32.5	42.7	27%
copper	194	245	23%
iron	7980	8670	8%
lead	337	434	25%
magnesium	671	645	4%
manganese	55.6	58.8	6%
mercury	0.93	0.97	4%
nickel	12.5	16.4	27%
vanadium	8.9	9.4	5%
zinc	468	1270	92%
tin	19.6	20.0	2%

Analyte	570SB00401, mg/kg	570CB00401, mg/kg	RPD
aluminum	4150	4210	1%
arsenic	4.0	3.8	5%
barium	22.9	22.8	0%
calcium	1330	1280	4%
chromium	5.7	6.2	8%
copper	20.2	18.5	9%
iron	2990	2890	3%
lead	68.9	112	48%
manganese	36.9	34.6	6%
mercury	0.07	0.07	0%
vanadium	6.0	6.1	2%
zinc	78.9	73.9	7%

The RPD's of aluminum, cadmium and zinc exceeded the 60% QC limit for field duplicate samples 023SB00401 and 023CB00401. The positive results for these analytes in the two samples were flagged as estimated (J). All RPD's were within the 60% QC limit for field duplicate soil samples 570SB00401 and 570CB00401. 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:

The ID number for sample 507CB00401 was incorrectly reported on the spreadsheets as "507CB0A401." This ID number was corrected on the spreadsheets by the validator to match the Chain-of-custody form. The electronic data file was not corrected. All laboratory data were acceptable with qualifications.

WET CHEMISTRY ANALYSES

HEXAVALENT CHROMIUM

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No data qualification was necessary.

III.) Blanks:

There were no positive detections in the method or field blanks, so no action was required.

IV.) Laboratory Check Samples (LCS):

There were no LCS's analyzed with this SDG. No action was taken.

V.) Laboratory Duplicates (MD):

All Laboratory Duplicate criteria were met, so no action was necessary.

VI.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD sample analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26899B Level III, CLP Organics and Inorganics

SAMPLES: 023SB00401, 023SB00402, 530SB01101, 530SB01102, 549SB01101, 549SB01102, 549SB01201, 549SB01202, 570SB00401, 570SB00402, 570P000401, 570T000401, GDET002801, GDET026D01, 570SB00402MS, 570SB00402MSD

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 Factor (RRF) for 2-chloroethyl vinyl ether was 0.026, which was below the 0.050 QC limit for the initial calibration analyzed on 9/13/96 on instrument N. The non-detect result for this compound in associated trip blank GDET002801 was rejected (R).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.028, which was below the 0.050 QC limit for the initial calibration analyzed on 9/17/96 on instrument R. The non-detect results for this compound in associated blanks 570P000401, 570T000401 and GDET026D01 were rejected (R).

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.016, which was below the 0.050 QC limit for the continuing calibration analyzed on 9/17/96 at 11:45 on instrument N. Since the non-detect result for this compound in the associated sample was previously rejected based on a very low RRF in the initial calibration, no further action was required.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.012, which was below the 0.050 QC limit for the continuing calibration analyzed on 9/18/96 at 10:10 on instrument R. Since the non-detect results for this compound in the associated samples were previously rejected based on a very low RRF in the initial calibration, no further action was required.

IV.) Blanks:

Method Blanks:

Acetone was detected at 7 ug/L in the method blank VBLK2. Since only trip and potable water blanks were associated with this method blank, no action was required.

Acetone (3 ug/L) and methylene chloride (2 ug/L) were detected in the method blank VBLK3. Since only a trip blank was associated with this method blank, no action was required.

Equipment Rinsate Blank:

Chloroform was detected at 10 ug/L in equipment rinsate blank GDEE002801 which was analyzed in SDG 26899A. Since there was no sample associated with this blank in this SDG, no action was taken.

Trip Blanks:

Chloroform was detected at 2 ug/L in both trip blanks GDET002801 and 570T000401. Since there was no sample associated with these trip blanks in this SDG, no action was taken.

Methylene chloride was detected at 8 ug/L in trip blank GDET026D01. Since there was no sample associated with this blank in this SDG, no action was taken.

Potable Water Blanks:

Acetone (13 ug/L), chloroform (29 ug/L) and bromodichloromethane (5 ug/L) were detected in potable water blank 570P000401. Since there was no sample associated with this blank in this fraction of the SDG, no action was taken.

Methylene chloride (12 ug/L), acetone (12 ug/L), chloroform (44 ug/L) and bromodichloromethane (8 ug/L) were detected in potable water blank GDEP026D01 which was analyzed in SDG 26899A. Since there was no sample associated with this blank in this fraction of the SDG, no action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD sample analyses were not performed in this fraction of the SDG. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples analyzed in this fraction of the SDG. No action was taken.

VIII.) Internal Standards Performance (ISTD):

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 taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The ID number for sample 507SB00401 was incorrectly reported on the spreadsheets as "507SB0A401." This ID number was corrected on the spreadsheets by the validator to match the Chain-of-custody form. The electronic data file was not corrected.

The results for 2-chloroethyl vinyl ether in all associated samples in this SDG were rejected due to very 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 taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of indeno(1,2,3-cd)pyrene was 38.1% , which exceeded the 30% QC limit for the standards analyzed on 9/24/96 on instrument T. The positive results for this compound in associated samples 023SB00401, 023SB00402, 549SB01101, 549SB01201, 549SB01202 and 570SB00401 were flagged as estimated (J).

Continuing Calibration:

The Percent Difference (%D) of bis(2-ethylhexyl)phthalate was 25.8% which exceeded the 25% QC limit for the standard analyzed on 9/23/96 at 10:39 on instrument J. Since the only associated sample was a portable water blank, no action was required.

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 13 ug/L in the method blank SBLK1. Since the only associated sample was a portable water blank, no action was required.

Equipment Rinsate Blank:

There were no positive detections in equipment rinsate blank GDEE00280,1 which was analyzed in SDG 26899A. No action was taken.

Potable Water Blank:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in potable water blank 570P000401. Detections of bis(2-ethylhexyl)phthalate in all associated soil samples less than 10X the blank amounts 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, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met, so no action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 570SB00401 and 023SB00401 were analyzed in this SDG, while duplicate samples 570CB00401 and 023CB00401 were analyzed in SDG 26899A. See SDG 26899A for Relative Percent Difference (RPD) tabulations. Since all RPD's were within the 60% QC limit for soil samples, 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:

All laboratory data were acceptable with qualifications. The ID number for sample 507SB00401 was incorrectly reported on the spreadsheets as "507SB0A401." This ID number was corrected on the spreadsheets by the validator to match the Chain-of-custody form. The electronic data file was not corrected.

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:

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 required.

Equipment Rinsate Blank:

There were no positive detections in equipment rinsate blank GDEE002801, which was analyzed in SDG 26899A. No action was taken.

Potable Water Blanks:

There were no positive detections in potable water blanks GDEP026D01 (analyzed in SDG 26899A) and

570P000401. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD sample analyses were not performed in this fraction of the SDG. No action was taken.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples designated in this fraction of the SDG. No action was taken.

IX.) 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.

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:
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:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PW	aluminum	134 ug/L	134 mg/kg
CCB1	antimony	4.80 ug/L	4.80 mg/kg
PW	barium	29.2 ug/L	29.2 mg/kg
PW	beryllium	0.30 ug/L	0.30 mg/kg
PW	calcium	18500 ug/L	18500 mg/kg
PW	chromium	1.30 ug/L	1.30 mg/kg
PW	cobalt	0.95 ug/L	0.95 mg/kg
PW	copper	2.50 ug/L	2.50 mg/kg
PW	Iron	21500 ug/L	21500 mg/kg
PW	magnesium	1120 ug/L	1120 mg/kg
PW	manganese	337 ug/L	337 mg/kg
ERB	mercury	0.10 ug/L	0.10 mg/kg
PW	nickel	2.70 ug/L	2.70 mg/kg
CCB4	silver	2.80 ug/L	2.80 mg/kg
PW	sodium	5720 ug/L	5720 mg/kg
CCB3	thallium	4.20 ug/L	4.20 mg/kg
PBS	tin	1.72 mg/kg	8.60 mg/kg
PW	vanadium	0.86 ug/L	0.86 mg/kg
ERB	cyanide	2.40 ug/L	2.40 mg/kg

CCB = Continuing Calibration Blank, ERB = Equipment Rinsate Blank,
PW = Potable Water Blank (GDEP026D01), PBS = Preparation Blank (Soil)

All results greater than the IDL but less than 5X the blank amount (Action Level) for which the contaminated blank was an associated calibration, preparation, equipment rinsate or potable water blank were flagged as undetected (U).

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

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
ICB	aluminum	-13.1 ug/L	13.1 mg/kg
ICB	chromium	-0.90 ug/L	0.90 mg/kg
ICB	iron	-23.6 ug/L	23.6 mg/kg
ICB	silver	-4.00 ug/L	4.00 mg/kg
ICB	vanadium	-1.90 ug/L	1.90 mg/kg

ICB = Initial Calibration Blank

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:

chromium	2 ug/L
thallium	9 ug/L

These analytes should not be present. Since aluminum, calcium, iron or magnesium was not 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	-3 ug/L
silver	-3 ug/L
vanadium	-4 ug/L

Since aluminum, calcium, iron or magnesium was not detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

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:

Duplicate Sample Analysis was not perform in this SDG. No action was taken.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of antimony were 68.8% and 69.3%, respectively, in spiked samples 570SB00402MS and 570SB00402MSD, which were below the 75-125% QC limits. All positive and non-detect results for antimony in all associated soil samples were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) of lead were 148.1%% and 141.5%, respectively, in spiked samples 570SB00402MS and 570SB00402MSD, which exceeded the 75-125% QC limits. All positive results for lead in all associated soil samples were flagged as estimated (J).

IX.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 570SB00401 and 023SB00401 were analyzed in this SDG, while duplicate samples 570CB00401 and 023CB00401 were analyzed in SDG 26899A. See SDG 26899A for Relative Percent Difference (RPD) tabulations. All RPD's met the 60% QC limit for soil samples, so 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. The ID number for sample 507SB00401 was incorrectly reported on the spreadsheets as "507SB0A401." This ID number was corrected on the spreadsheets by the validator to match the Chain-of-custody form. The electronic data file was not corrected.

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:	0143
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVEL:	EPA Level III
EPA METHOD:	EPA SOW 3-90 / SW-846
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, Cyanide, pH
SDG NUMBER:	26957

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
531SB00501	26957.14	Soil		X		X
531SB00501DL	26957.14DL	Soil		+		
531SB00502	26957.15	Soil		X		X
580SB00701	26957.11	Soil		X		X
580SB00702	26957.12	Soil		X		X
580SB00801	26957.13	Soil		X		X
580SB00901	26957.09	Soil		X		X
580SB00902	26957.10	Soil		X		X
590SB00601	26957.08	Soil		X		X
598SB00501	26957.06	Soil		X		X
598SB00502	26957.07	Soil		X		X
598SB00601	26957.05	Soil		X		X
599SB00601	26957.03	Soil		X		X
599SB00602	26957.04	Soil		X		X
599SB00701	26957.01	Soil		X		X
599SB00701DL	26957.01DL	Soil		+		
599SB00702	26957.02	Soil		X		X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
590DB00601	26957.17	Water	X	X	X	X
590EB00601	26957.16	Water	+	X	X	X
590EB00601RE	26957.16RE	Water	X			
590TB00601	26957.18	Water	X			
531SB00501MS	26957.14MS	Soil		+		
531SB00501MSD	26957.14MSD	Soil		+		

Client Sample #	Lab Sample #	Matrix	Cyanide	pH
531SB00501	26957.14	Soil		X
531SB00502	26957.15	Soil		X
590DB00601	26957.17	Water	X	
590EB00601	26957.16	Water	X	

+ = Non-billable Analysis

DB = DEIONIZED WATER BLANK, DL = DILUTION, EB = EQUIPMENT RINSATE BLANK, 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 association numerical value is an estimated quantity.
R	-	The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U	-	The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ	-	The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 26957 CLP Organics and Inorganics

SAMPLES: 531SB00501, 531SB00501DL, 531SB00502, 580SB00701, 580SB00702, 580SB00801, 580SB00901, 580SB00902, 580SB00601, 598SB00501, 598SB00502, 598SB00601, 599SB00601, 599SB00602, 599SB00701, 599SB00701DL, 599SB00702, 590DB00601, 590EB00601, 590EB00601RE, 590TB00601, 531SB00501MS, 531SB00501MSD

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) was 0.028 for 2-chloroethyl vinyl ether in the standard analyzed on 9/17/96 on instrument R, which was below the 0.050 QC limit. The results for this compound in associated blanks 590DB00601 and 590TB00601, which were both non-detects, were rejected (R).

The Percent Relative Standard Deviation (%RSD) for 2-chloroethyl vinyl ether was 84.5% for the standards analyzed on 9/17/96 on instrument R, which exceeded the 30% QC limit. The results for this compound in the associated blanks were previously rejected. No further action was necessary.

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 09/20/96 at 18:23 on instrument N for bromoform (39.3%). Since the associated sample was a field blank, no action was required.

The Relative Response Factor (RRF) was 0.011 for 2-chloroethyl vinyl ether in the standard analyzed on 9/19/96 at 14:24 on instrument R, which was below the 0.050 QC limit. The results for this compound in associated blanks 590DB00601 and 590TB00601 were previously rejected, so no further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 09/19/96 at 14:24 on instrument R for 2-chloroethyl vinyl ether (60.7%). The results for this compound in the associated blanks were previously rejected. No further action was taken.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blanks:

Methylene chloride was detected at 10 ug/L in the deionized water blank and at 9 ug/L in the trip blank and the equipment rinsate blank. Chloroform was detected at 18 ut/L in the deionized water blanks and at 1 ug/L and 16 ug/L, respectively, in the trip blank and the equipment rinsate blank. Since there were no other samples in this SDG fraction , no action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for 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.

VIII.) Field Duplicates:

There were no field duplicate samples identified in this SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standards Performance criteria were met after the reanalysis of the equipment rinsate blank. 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 reanalysis of sample 590EB00601 was considered by the validator to be of preferable data quality to the original analysis because of improved Internal Standards area counts.

The non-detect results for 2-chloroethyl vinyl ether were rejected in all three blank samples due to a low RRF in the initial calibration. All other laboratory data were acceptable without qualification.

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:

The Percent Relative Standard Deviation (%RSD) was 31.3% for hexachlorocyclopentadiene for the standards analyzed on 9/26/96 on instrument T, which exceeded the 30% QC limit. This compound was not detected in the associated samples, so no action was required.

The Percent Relative Standards Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 9/30/96 on instrument T for benzo(k)fluoranthene (30.5%) and indeno(1,2,3-cd)pyrene (38.8%). The positive results for these compounds in associated sample 598SB00601 were flagged as estimated (J).

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 9/27/96 at 11:11 on instrument T for the following compounds:

hexachlorocyclopentadiene	97.5%
2,4-dinitrophenol	67.9%
4,6-dinitro-2-methylphenol	40.8%

indeno(1,2,3-cd)pyrene	43.3%
benzo(g,h,i)perylene	49.6%

All positive and non-detect results for these compounds in associated samples 531SB00502, 599SB00702, 599SB00601, 599SB00602, 598SB00502, 598SB00601, 580SB00901 and 580SB00701 were flagged as estimated (J) and (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 3 ug/L in method blank SBLK2. Since the associated samples were field blanks, no action was required.

Field Blanks:

Bis(2-ethylhexyl)phthalate was detected in deionized water blank 590DB00601 and equipment rinsate blank 590EB00601 at 11 ug/L and 2 ug/L, respectively. The detection of this compound in associated sample 580SB000801, which was less than 10X the blank amounts, was flagged as undetected (U) with the result less than the CRQL being raised to the CRQL.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2-fluorophenol was 14% for sample 590DB00601, which was below the 21-100% QC limits. Since the sample was a deionized water blank, no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) for pyrene was 61% for spiked samples 531SB00501MS and 531SB00501MSD, which exceeded the 36% QC limit. The positive result for this sample in associated unspiked sample 531SB00501 was flagged as estimated (J).

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. Several Percent Recoveries (%R's) were outside the QC limits. Data validation based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples identified in this SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

The following Internal Standards area counts exceeded the 50-200% QC limits for sample 531SB00501:

naphthalene-d8	221%
acenaphthene-d10	215%
phenanthrene-d10	206%

All positive results for the compounds quantitated on these standards were flagged as estimated (J).

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 results for fluoranthene and pyrene in sample 531SB00501 and results for fluorene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene and indeno(1,2,3-cd)pyrene in sample 599SB00701 were greater than the instrument's linear calibration range. These results were replaced by the validator with dilution analysis results and flagged as dilution results (D). 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 Difference (%D) was 26.0% for beta-BHC in the standard analyzed on 9/28/96 at 11:05 on the secondary column, which exceeded the 25% QC limit. Since the associated samples were field blanks, no action was required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 24.3% for methoxychlor in the standards analyzed on 9/27/96 on the secondary column, which exceeded the 20% QC limit. Since only one compound exceeded the 20% QC limit, no action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the the standard analyzed on 9/30/96 at 17:10 on both columns for the following compounds:

Compound	%R Column 1	%R Column 2
aldrin	26.1%	27.3%
4,4'-DDE	28.0%	26.2%
heptachlor epoxide		26.8%
endosulfan II		26.2%
endrin ketone		27.7%

Since the associated sample was a method blank, no action was required.

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 equipment rinsate blank and the deionized water blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

No MS / MSD analyses were performed in this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples identified in this SDG. No action was necessary.

IX.) 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.

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:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
590EB00601	calcium	99.2 ug/L	99.2 mg/kg
590EB00601	copper	4.00 ug/L	4.00 mg/kg
590EB00601	lead	4.50 ug/L	4.50 mg/kg
ICB	thallium	5.10 ug/L	5.10 mg/kg
PBS	tin	1.08 mg/kg	5.40 mg/kg
590EB00601	zinc	60.6 ug/L	60.6 mg/kg

590EB00601 = Equipment Rinsate Blank, ICB = Initial Calibration Blank,
PBS = Preparation Blank (Soil)

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 or equipment rinsate 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.
PBW	aluminum	-22.5 ug/L	22.5 ug/L
CCB2	antimony	-4.50 ug/L	4.50 ug/L
CCB3	barium	-0.90 ug/L	0.90 ug/L
CCB3	iron	-32.0 ug/L	32.0 ug/L

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	nickel	-1.30 ug/L	1.30 ug/L
CCB3	selenium	-4.10 ug/L	4.10 ug/L
CCB1	silver	-3.80 ug/L	3.80 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 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:

barium	2 ug/L
chromium	1 ug/L
lead	5 ug/L
manganese	1 ug/L

These analytes should not be present. Additionally, a negative result was observed for selenium (-9 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 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 required.

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 Recoveries:

Matrix Spike analysis was not performed in this SDG. No action was required.

IX.) Field Duplicates:

No field duplicate samples were identified in this SDG. 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 required.

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 evaluation was not required for pH determination. 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 of the SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not required in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

There were no field duplicate samples identified in this SDG. No action was required.

VIII.) 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 Navel Base, Zone E
SERVICE ORDER NUMBER:	0140
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:	Soil
TYPES OF ANALYSES:	Semivolatile Organics, Total Metals, pH
SDG NUMBERS:	26963 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Semi-Volatiles	Total Metals	pH
530SB00901	26963.07	Soil	X	X	
530SB00902	26963.08	Soil	X	X	
530SB01001	26963.05	Soil	X	X	
530SB01002	26963.06	Soil	X	X	
550SB00901	26963.03	Soil	X	X	
550SB00902	26963.04	Soil	X	X	
550SB01001	26963.01	Soil	X	X	
550SB01002	26963.02	Soil	X	X	
569SB00701	26963.19	Soil	X	X	X
569SB00702	26963.20	Soil	X	X	X
569SB00901	26963.13	Soil	X	X	
569SB00902	26963.14	Soil	X	X	
572SB01001	26963.09	Soil	X	X	
572SB01002	26963.10	Soil	X	X	
572SB01101	26963.11	Soil	X	X	
572SB01102	26963.12	Soil	X	X	
579SB00501	26963.15	Soil	X	X	
579SB00502	26963.16	Soil	X	X	
579SB00601	26963.17	Soil	X	X	

Client Sample #	Lab Sample #	Matrix	Semi-Volatiles	Total Metals	pH
579SB00602	26963.18	Soil	X	X	
550SB01001MS	26963.01MS	Soil	+		
550SB01001MSD	26963.01MSD	Soil	+		

+ = Non-billable Quality Control Sample

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

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

RELEASE SIGNATURE:

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 26963 CLP Organics and Inorganics

SAMPLES: 530SB00901, 530SB00902, 530SB01001, 530SB01002, 550SB00901, 550SB00902, 550SB01001, 550SB01002, 569SB00701, 569SB00702, 569SB00901, 569SB00702, 569SB00901, 569SB00902, 572SB01001, 572SB01002, 572SB01101, 572SB01102, 579SB00501, 579SB00502, 579SB00601, 579SB00602, 550SB01001MS, 550SB01001MSD

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 taken.

III.) Calibration:

The Percent Relative Standard Deviation (%RSD) for di-n-butylphthalate was 30.7% for the standards analyzed on 9/23/96 on instrument S, which exceeded the 30% QC limit. Di-n-butylphthalate was not detected in the associated samples. No action was necessary.

The Percent Relative Standard Deviation (%RSD) for 2,4-dinitrophenol was 39.3% for the standards analyzed on 9/26/96 on instrument S, which exceeded the 30% QC limit. 2,4-Dinitrophenol was not detected in the associated samples. No action was required.

The Percent Relative Standard Deviations (%RSD's) for 2,4-dinitrophenol and bis(2-ethylhexyl)phthalate were 31.4% and 31.1%, respectively, for the standards analyzed on 9/27/96 on instrument S, which exceeded the 30% QC limit. The two compounds were not detected in associated sample 569SB00702. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 9/25/96 at 10:20 on instrument S for the following compounds:

n-nitroso-di-n-propylamine	27.0%
2,4-dinitrophenol	34.3%
di-n-butylphthalate	30.9%
butylbenzylphthalate	28.9%

bis(2-ethylhexyl)phthalate	41.5%
benzo(b)fluoranthene	28.2%

All positive and non-detect results for these compounds in the associated samples were flagged as estimated (J) and (UJ). The associated samples were 530SB00901, 530SB00902, 530SB01001, 530SB01002, 550SB00901, 550SB00902, 550SB01001, 550SB01002 and 572SB01001.

IV.) Blanks:

There were no positive detections in the method blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in 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:

Field duplicate samples were not analyzed in this SDG. No action was taken.

IX.) Internal Standards Performance:

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:

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:

Initial Calibration:

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

Continuing Calibration Verification (CCV):

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

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB1	antimony	3.30 ug/L	3.30 mg/kg
CCB4	beryllium	0.50 ug/L	0.50 mg/kg
CCB4	vanadium	0.80 ug/L	0.80 mg/kg

CCB = Continuing Calibration Blank

All results greater than the IDL but less than 5X the blank amount (Action Level, mg/kg for soils) for which the contaminated blank was an associated calibration blank were flagged as undetected (U).

A negative result with an absolute value greater than the IDL was observed for aluminum (-1.76 mg/kg) in the soil preparation blank (PBS). The results for aluminum in all SDG samples exceeded 5X the absolute value of the negative blank result. No action was necessary.

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	5 ug/L
barium	3 ug/L
beryllium	1 ug/L
nickel	3 ug/L
vanadium	4 ug/L

These analytes should not be present. Additionally, negative results were observed in ICS Solution A at absolute concentrations greater than the IDL for cadmium (-3 ug/L) and chromium (-1 ug/L). Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Difference (%D) of chromium was 23.4% in dilution sample 550SB01001L, which exceeded the 10% QC limit. Positive results for this analyte 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/ Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. 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.

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 was not required for pH determination. 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 for this SDG. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD sample analyses were not required for pH determination. No action was necessary.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. 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:	0145
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 MATRICES:	Sediment and Soil
TYPES OF ANALYSES:	Volatile Organics, Semivolatile Organics, Total Metals, pH
SDG NUMBER:	26978 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Total Metals	pH
528MO00101	27111.01	Sediment	X	X		X
528MO00101DL	27111.01DL	Sediment		+		
528MO00101RE	27111.01RE	Sediment	+			
528TO00101	27111.02	Soil	X			
549SB01301	27063.01	Soil		X	X	
549SB01302	27063.02	Soil		X	X	
549SB01401	27063.03	Soil		X	X	
549SB01402	27063.04	Soil		X	X	
551SB00701	26996.01	Soil		X	X	X
583SB01001	26878.01	Soil		+	X	
583SB01001RE	26878.01RE	Soil		X		
605SB01701	26978.02	Soil		+	X	
605SB01701RE	26978.02RE	Soil		X		
605SB01702	26978.03	Soil		X	X	

+ = Non-billable Analysis

DL = DILUTION, RE = REANALYSIS

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc. - 26978 Level III, CLP Organics and Inorganics

SAMPLES: 528MO00101, 528MO00101DL, 528MO00101RE, 549SB01301, 549SB01302, 549SB01401, 549SB01402, 551SB00701, 583SB01001, 583SB01001RE, 605SB01701, 605SB01701RE, 605SB01702, 528TO00101

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 Factor (RRF) for 2-chloroethyl vinyl ether was 0.031, which was below the 0.050 QC limit for the initial calibration analyzed on 09/16/96 on instrument I. The non-detect results for this compound in associated samples 528MO00101 and 528TO00101 were rejected (R).

The Percent Relative Standard Deviation (%RSD's) exceeded the 30% QC limit for the standards analyzed on 09/16/96 on instrument I for the following compounds:

chloroethane	44.4%
acetone	37.0%
2-chloroethyl vinyl ether	78.1%

There were no associated positive detections of these compounds, so no action was taken.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether (0.031) was below the 0.050 QC limit for the standard analyzed on 10/03/96 at 14:22 on instrument I. Since the non-detect 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 standard analyzed on 10/03/96 at 14:22 on instrument I for the following compounds:

acetone	39.3%
2-butanone	32.2%
vinyl acetate	63.4%
4-methyl-2-pentanone	29.6%
2-hexanone	29.4%

The results for these compounds in the associated samples, which consisted entirely of non-detects after blank qualification, were flagged as estimated (UJ). The associated samples were 528MO00101 and 528TO00101.

IV.) Blanks:

Method Blanks:

Acetone was detected at 12 ug/kg in method blank VBLK1. Detections of acetone in the 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 528MO00101 and 528TO00101.

Trip Blank:

There was no trip blank in this SDG. Sample 528TO00101 was identified on the Chain-of-Custody form as a soil sample, even though the sample ID would indicate that it was a trip blank. This sample was validated as a soil sample. The electronic data for this sample were changed by the validator to "Report A."

V.) Surrogate Recoveries:

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

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not designated in this SDG. No action was necessary.

VII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was required.

VIII.) Internal Standards Performance (ISTD):

The internal standard area count for chlorobenzene-d5 was 49% in sample 528MO00101, which was below the 50-200% QC limits. The results for compounds quantitated on this ISTD, which consisted entirely of non-detects, were flagged as estimated (UJ).

IX.) TCL Compound Identification:

All TCL Compound Identification criteria were met, so no action was taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The non-detect results for 2-chloroethyl vinyl ether in the two associated samples were rejected (R) due to very low RRF's in the initial and continuing calibrations. The original analysis of sample 528MO00101 was considered by the validator to be of preferable data quality to the reanalysis because of better internal standard performance. The reanalysis of this sample was not validated. Both samples were analyzed within the required holding times. 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 taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD's) exceeded the 30% QC limit for the standards analyzed on 10/17/96 on instrument S for hexachlorocyclopentadiene (33.5%). Since this compound was not detected in the associated samples, no action was necessary.

Continuing Calibration:

The Percent Difference (%D) of benzo(b)fluoranthene was 28.1%, which exceeded the 25% QC limit, for the standard analyzed on 010/16/96 at 08:06 on instrument J. The positive and non-detect results for this compound in the associated samples were flagged as estimated (J) and (UJ). The associated samples were 549SB01301, 549SB01302, 549SB01401 and 549SB01402.

IV.) Blanks:

Butylbenzylphthalate was detected at 39 ug/kg in method blank SBLK4. The detection of butylbenzylphthalate in associated sample 528MO00101 was more than 10X the blank amount, so no action was required. This compound was not detected in the other samples, so no action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not designated in this SDG. No action was taken.

VII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was taken.

VIII.) Internal Standards Performance:

The internal standard area counts were below the 50-200% QC limits for following samples:

Sample	Perylene-d12
583SB01001RE	32%
605SB01701RE	32%

The positive and non-detect results for compounds quantitated on this ISTD in the two samples were flagged as estimated (J) and (UJ).

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):

The detection of bis(2-ethylhexyl)phthalate in sample 528MO00101 was above the instrument's linear calibration range. The undiluted value was replaced with the diluted value from sample 528MO00101DL for this compound with appropriate flagging.

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 re-extractions/reanalyses of samples 583SB01001 and 605SB01701 were considered by the validator to be of preferable data quality to the original analyses because of improved internal standard performances. 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:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB3	aluminum	18.0 ug/L	18.0 mg/kg
CCB3	beryllium	0.12 ug/L	0.12 mg/kg
PBS1	chromium	0.12 mg/kg	0.60 mg/kg
PBS2	iron	2.46 mg/kg	12.3 mg/kg
PBS1	tin	1.72 mg/kg	8.59 mg/kg
PBS2	vanadium	0.06 mg/kg	0.30 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).

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

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB7	aluminum	-14.7 ug/L	14.7 mg/kg
CCB6	chromium	-1.00 ug/L	1.00 mg/kg
CCB4	cobalt	-0.80 ug/L	0.80 mg/kg
PBS	thallium	-0.36 mg/kg	1.80 mg/kg

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

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

IV.) ICP Interference Check Sample Results:

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

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

arsenic	8 ug/L
barium	3 ug/L
nickel	4 ug/L
vanadium	3 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium 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:

antimony	-5 ug/L
cadmium	-3 ug/L
selenium	-4 ug/L
thallium	-6 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

ICP 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):

Matrix Spike sample analysis was not performed in this SDG. No action was taken

IX.) Field Duplicates:

There were no field duplicate samples 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.

pH

I.) Holding Times:

The holding times to analyses were 2 to 7 days for samples 551SB00701 and 528MO00101, which exceeded the 24-hour QC limit. The pH results for these two samples were flagged as estimated (J).

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Laboratory Check Samples (LCS):

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

IV.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

V.) Field Duplicates:

There were no field duplicate samples designated for this SDG. No action was taken.

VI.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualifications.

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
605GW00303*	27441.05	Water				X
GDEGW00103	27441.06	Water	X	X	X	X
GDEGW00203	27441.07	Water	X	X	X	X
GDEGW01D03	27450.03	Water	X	X	X	X
GDEGW02601	27450.07	Water	X	X	X	X
GDEGW02D03	27450.02	Water	X	X	X	X
GDEGW26D01	27450.08	Water	X	X	X	X
GDEDW02601	27450.06	Water	X	X	X	X
GDEEW02601	27450.05	Water	X	X	X	X
GDETW00203	27441.08	Water	X			
GDETW01D03	27450.04	Water	X			
GDETW02601	27450.09	Water	X			
GDEGW00103MS	27441.06MS	Water	+			
GDEGW00103MSD	27441.06MSD	Water	+			
GDEGW26D01MS	27450.06MS	Water	+			
GDEGW26D01MSD	27450.06MSD	Water	+			

* = Field duplicate was associated with sample 605HW00303 in SDG 27441A.

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK,
MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
018GW00103	27441.01	Water		X	X	X
018GW00203	27441.02	Water		X	X	X
106GW00103	27450.01	Water		X	X	X
GDEGW00103	27441.06	Water	X	X	X	X
GDEGW00203	27441.07	Water	X	X	X	X
GDEGW01D03	27450.03	Water	X	X	X	X
GDEGW02601	27450.07	Water	X	X	X	X
GDEGW02D03	27450.02	Water	X	X	X	X
GDEGW26D01	27450.08	Water	X	X	X	X
GDEDW02601	27450.06	Water	X	X	X	X
GDEEW02601	27450.05	Water	X	X	X	X

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27441 Appendix IX CLP Inorganics

SAMPLE: 605HW00303

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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB2	antimony	2.80 ug/L	14.0 ug/L
GDEEW02601	barium	0.32 ug/L	1.60 ug/L
GDEEW02601	calcium	28.3 ug/L	141 ug/L
PBW	cobalt	1.05 ug/L	5.25 ug/L
CCB4	copper	2.10 ug/L	10.5 ug/L
GDEEW02601	nickel	4.60 ug/L	23.0 ug/L
GDEEW02601	vanadium	0.64 ug/L	3.20 ug/L
GDEEW02601	zinc	7.8 ug/L	39.0 ug/L

CCB = Continuing Calibration Blank, PBW= Preparation Blank (Water),
GDEEW02601 = Equipment Rinsate 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, preparation 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.

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

nickel	3 ug/L
selenium	4 ug/L
tin	3 ug/L
vanadium	1 ug/L

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

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

antimony	-5 ug/L
arsenic	-6 ug/L
barium	-2 ug/L
cadmium	-4 ug/L
cobalt	-1 ug/L
copper	-3 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the sample 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 Analysis criteria was met. 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Field duplicate samples 605HW00303 and 605GW00303 (analyzed in SDG 27441B) were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	605GW00303, ug/L	605HW00303, ug/L	RPD
aluminum	116	105	9.9%
arsenic	48.9	46.0	6.1%
barium	75.2	69.6	7.7%
calcium	77800	72300	7.3%
chromium	2.6	2.4	8.0%
iron	5020	4660	7.4%
magnesium	11600	10800	7.1%
manganese	169	157	7.4%
potassium	10600	9800	7.8%
sodium	55600	51500	7.6%

None of the RPD's exceeded 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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 Laboratories of Oklahoma, Inc. - 27441 CLP Organics and Inorganics

SAMPLES: 018GW00103, 018GW00203, 106GW00103, 605GW00103, 605GW00203, 605GW00303, GDEGW00103, GDEGW00203, GDEGW01D03, GDEGW02601, GDEGW02D03, GDEGW26D01, GDEDW02601, GDEEW02601, GDETW00203, GDETW01D03, GDETW02601, GDEGW00103MS, GDEGW00103MSD, GDEGW26D01MS, GDEGW26D01MSD

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) was 39.3% for acetone in the standards analyzed on 10/11/96 on instrument K, which exceeded the 30% QC limit. There were no positive results for this compound in the associated samples after blank qualification, so no action was required.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.034 for the standard analyzed on 11/01/96 at 12:39 on instrument K, which was below the 0.050 QC limit. The results for this compound in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples and blanks were GDEGW00103, GDEGW00203, GDETW00203, GDEGW02D03, GDEGW01D03, GDETW01D03, GDEEW02601, GDEDW02601 and GDEGW02601.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/01/96 at 12:39 on instrument K for the following compounds:

2-chloroethyl vinyl ether	51.4%
vinyl acetate	37.3%
dibromochloromethane	27.5%
trans-1,3-dichloropropene	26.7%
bromoform	30.4%

2-hexanone	30.7%
1,1,2,2-tetrachloroethane	26.8%

The results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. The results for the other compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDEGW00103, GDEGW00203, GDEGW02D03, GDEGW01D03 and GDEGW02601.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.037 for the standard analyzed on 11/04/96 at 09:35 on instrument K, which was below the 0.050 QC limit. The results for this compound in associated sample GDEGW26D01 and blank GDETW02601, which consisted entirely of non-detects, were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/04/96 at 09:35 on instrument K for the following compounds:

2-chloroethyl vinyl ether	47.1%
bromomethane	34.2%
vinyl acetate	40.1%

The results for these compounds in associated sample GDEGW26D01, 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.

Deionized Water and Equipment Rinsate Blanks:

Acetone and chloroform were detected at 12 ug/L and 2 ug/L, respectively, in deionized water blank GDEDW02601 and equipment rinsate blank GDEEW02601. The positive result for chloroform in associated sample GDEGW26D01, which was less than 5X the blank result, was flagged as undetected (U) with the detection limit being raised to the level of contamination in the sample. The results for acetone in the associated samples were flagged based on the trip blanks.

Trip Blanks:

Acetone was detected at 37 ug/L in trip blank GDETW00203. All positive results for this compound in associated samples GDEGW00103 and GDEGW00203, which were 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.

Acetone and carbon disulfide were detected at 20 ug/L and 3 ug/L, respectively, in trip blank GDETW01D03. The positive results for acetone in associated samples GDEGW01D03 and GDEGW02D03, 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. There were no positive results for

carbon disulfide in the associated samples, so no further action was required.

Acetone and methylene chloride were both detected at 6 ug/L in trip blank GDETW02601. All positive results for these compounds in associated samples GDEGW02601 and GDEGW26D01, less than 10X the blank amount, were flagged as undetected (U) with results less than the CRQL being raised to the CRQL.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG, so no action was required.

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 in all SDG samples and blanks were rejected based on low RRF's in the 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:

All Initial and 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 Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks in this SDG. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG, so no action was required.

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 without 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 required.

III.) Calibration:

All Initial and 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 Water and Equipment Rinsate Blanks:

There were no positive detections in the two field blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) 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.

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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB2	antimony	2.80 ug/L	14.0 ug/L
GDEEW02601	barium	0.32 ug/L	1.60 ug/L
GDEEW02601	calcium	28.3 ug/L	141 ug/L
PBW	cobalt	1.05 ug/L	5.25 ug/L
CCB4	copper	2.10 ug/L	10.5 ug/L
GDEEW02601	nickel	4.60 ug/L	23.0 ug/L
GDEEW02601	vanadium	0.64 ug/L	3.20 ug/L
GDEEW02601	zinc	7.8 ug/L	39.0 ug/L

CCB = Continuing Calibration Blank, PBW= Preparation Blank (Water),
GDEEW02601 = Equipment Rinsate Blank

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, preparation or equipment rinsate blank were flagged as undetected (U).

Cyanide had a negative result (-9.40 ug/L) with an absolute value greater than the IDL in the second continuing calibration blank. All associated positive sample results less than 5X the absolute value of the negative blank results (47.0 ug/L) and 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 positive concentrations greater than the IDL:

nickel	3 ug/L
selenium	4 ug/L
tin	3 ug/L
vanadium	1 ug/L

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

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

antimony	-5 ug/L
arsenic	-6 ug/L
barium	-2 ug/L
cadmium	-4 ug/L
cobalt	-1 ug/L
copper	-3 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration

comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria was met. No action was required.

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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, 605HW00303 (analyzed in SDG 27441A) and 605GW00303, was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	605GW00303, ug/L	605HW00303, ug/L	RPD
aluminum	116	105	9.9%
arsenic	48.9	46.0	6.1%
barium	75.2	69.6	7.7%
calcium	77800	72300	7.3%
chromium	2.6	2.4	8.0%
iron	5020	4660	7.4%
magnesium	11600	10800	7.1%
manganese	169	157	7.4%
potassium	10600	9800	7.8%
sodium	55600	51500	7.6%

None of the Relative Percent Differences (RPD's) exceeded 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 required.

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.

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 in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field 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):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples in this fraction. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

There were no positive detections in the two field 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:

There were no field duplicate samples in this SDG. 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.

Deionized Water and Equipment Rinsate Blanks:

TDS was not detected in the two field 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):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples in this fraction. 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:	0156
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Levels III & IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27464A (Level IV) 27464B (Level III)

SAMPLES:

SDG 27464A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEHW04D03	27465.02	Water	X	X	X	X
596HW00103	27465.01	Water				X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEHW04D03	27465.02	Water	X	X	X	X
596HW00103	27465.01	Water		X	X	X

H = FIELD DUPLICATE SAMPLE (Associated with primary sample in SDG 27464B)

SDG 27464B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
065GW00701	27464.11	Water	X	X	X	X
065GW00801	27464.13	Water	X	X	X	X
106GW01D03	27464.01	Water				X
596GW00103*	27464.02	Water				X
596GW00203	27464.04	Water				X
596GW00303	27464.05	Water				X
596GW01D03	27464.03	Water				X
GDEGW02801	27464.15	Water	X	X	X	X
GDEGW03D03	27464.06	Water	X	X	X	X
GDEGW04D03	27464.09	Water	X	X	X	X
GDEGW05D03	27464.07	Water	X	X	X	X
GDEGW06D03	27464.08	Water	X	X	X	X
GDEGW28D01	27464.14	Water	X	+	X	X
GDEGW28D01RE	27464.14RE	Water		X		
065FW00701	27464.12	Water	X	X	X	X
065TW00701	27464.16	Water	X			
GDETW04D03	27464.10	Water	X			
GDEGW02801MS	27464.15MS	Water		+	+	
GDEGW02801MSD	27464.15MSD	Water		+	+	

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
065GW00701	27464.11	Water	X	X	X	X
065GW00801	27464.13	Water	X	X	X	X
106GW01D03	27464.01	Water		X	X	X
596GW00103*	27464.02	Water		X	X	X
596GW00203	27464.04	Water		X	X	X
596GW00303	27464.05	Water		X	X	X
596GW01D03	27464.03	Water		X	X	X
GDEGW02801	27464.15	Water	X	X	X	X
GDEGW03D03	27464.06	Water	X	X	X	X
GDEGW04D03*	27464.09	Water	X	X	X	X
GDEGW05D03	27464.07	Water	X	X	X	X
GDEGW06D03	27464.08	Water	X	X	X	X
GDEGW28D01	27464.14	Water	X	X	X	X
065FW00701	27464.12	Water	X	X	X	X

+ = Non-billable Analysis, * = Sample was associated with field duplicate sample in SDG 27464A.
F = FIELD BLANK, 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 association numerical value is an estimated quantity.
R	-	The data are unusable (the compound/analyte may or may not be present). Resampling and reanalysis are necessary for verification.
U	-	The compound/analyte was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
UJ	-	The compound/analyte was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27464A Appendix IX CLP Organics and Inorganics

SAMPLES: GDEHW04D03, 596HW00103

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 11/01/96 on instrument R for the following compounds:

acrolein	0.043
trans-1,4-dichloro-2-butene	0.049
acetonitrile	0.021
isobutyl alcohol	0.006
1,4-dioxane	0.002

The results for these compounds in associated sample GDEHW04D03, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 11/01/96 on instrument R exceeded the 30% QC limit for the following compounds:

trans-1,4-dichloro-2-butene	52.8%
bromomethane	30.2%
chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%
dichlorodifluoromethane	38.7%

The non-detect result for trans-1,4-dichloro-2-butene was previously rejected based on a low RRF in the initial calibration. Since there were no positive results for the other compounds in associated sample GDEHW04D03, no further action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Method Blanks:

Acetone was detected at 6.0 ug/L in method blank VBLK1. The positive result for this compound in associated sample GDEHW04D03, which was less than 10X the blank amount, was flagged as undetected (U), with the result being left at the CRQL.

Field Blank:

Methylene chloride, acetone, chloroform, dibromochloromethane and bromodichloromethane were detected at 7 ug/L, 6 ug/L, 4 ug/L, 2 ug/L and 2 ug/L, respectively, in field blank 065FW00701. Acetone was previously qualified using the method blank. There were no positive detections of the other compounds in the associated sample. No further action was taken.

Trip Blanks:

Acetone and methylene chloride were detected at 7 ug/L and 8 ug/L, respectively, in trip blank GDETW04D03. The positive result for acetone in associated sample GDEHW04D03 was previously flagged as undetected (U) based on the method blank. Since methylene chloride was not detected in the associated sample, no action was necessary.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples GDEHW04D03 and GDEGW04D03 (analyzed in SDG 27464B). No action was required.

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 acrolein, trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample GDEHW04D03 based on 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, 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 11/13/96 on instrument A for aramite (0.045) and hexachlorophene (0.036). The results for these compounds in associated sample GDEHW04D03, 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 11/13/96 on instrument A for the following compounds:

methyl methanesulfonate	38.5%
n-nitrosomethylethylamine	36.6%
n-nitrosodiethylamine	31.8%
ethyl methanesulfonate	34.3%
acetophenone	35.3%
n-nitrosopyrrolidine	34.6%
2-picoline	40.8%
p-phenylenediamine	44.7%
m-cresol	32.7%
n-nitrosomorpholine	37.5%
o-toluidine	35.9%
n-nitroso-piperidine	36.7%
o,o,o-triethyl phosphorothionate	35.1%
2,6-dichlorophenol	34.7%
n-nitroso-di-n-butylamine	36.2%
1,2,4,5-tetrachlorobenzene	38.5%
safrole	35.0%
isosafrole	36.3%
1,4-napthoquinone	40.3%
1,3-dinitrobenzene	32.0%
1-naphthylamine	38.0%
4-nitroquinoline-1-oxide	46.9%
2-naphthylamine	36.1%
thionazin	34.6%
pentachlorobenzene	33.8%
pentachlorophenol	37.2%
diphenylamine	33.7%
sulfotepp	37.2%
1,3,5-trinitrobenzene	33.7%
phorate	44.8%
phenacetin	35.0%
diallate	30.6%
dimethoate	34.3%
4-aminobiphenyl	39.8%
pronamide	39.2%
pentachloronitrobenzene	34.2%
disulfoton	32.8%
methyl parathion	33.1%
parathion	35.7%
methapyrilene	44.9%
isodrin	36.1%
chlorobenzilate	36.1%
3,3'-dimethylbenzidine	43.4%
kepone	43.9%
famphur	65.0%
2-acetylaminofluorene	36.0%
7,12-dimethylbenz(a)anthracene	34.9%
hexachlorophene	49.0%

There were no positive results for these compounds in the associated sample. No action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.033) and hexachlorophene (0.014) in the standards analyzed on 11/13/96 at 08:55 on instrument A were below the 0.050 QC limit. The results for these compounds in associated sample GDEHW04D03 were previously rejected based on low RRF's in the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/13/96 at 08:55 on instrument A for the following compounds:

aramite	32.3%
methyl methanesulfonate	64.7%
n-nitrosomethylethylamine	68.2%
n-nitrosodiethylamine	57.0%
ethyl methanesulfonate	65.1%
acetophenone	61.5%
n-nitrosopyrrolidine	57.4%
2-picoline	70.3%
nitrobenzene	50.2%
n-nitrosomorpholine	39.9%
o-toluidine	65.1%
n-nitroso-piperidine	35.3%
o,o,o-triethyl phosphorothionate	50.1%
n-nitroso-di-n-butylamine	31.6%
safrole	56.8%
isosafrole	49.6%
2,6-dinitrotoluene	44.7%
1,4-naphthoquinone	35.1%
1-naphthylamine	51.9%
thionazin	63.8%
phorate	31.4%
dimethoate	43.7%
pronamide	30.4%
2,4-dinitrotoluene	29.7%
4-aminobiphenyl	47.8%
disulfoton	32.3%
methapyrilene	79.6%
isodrin	70.0%
chlorobenzilate	25.0%
3,3'-dimethylbenzidine	30.8%
m-cresol	43.1%
4-nitroquinoline-1-oxide	58.5%
diphenylamine	76.8%
sulfotepp	77.7%
7,12-dimethylbenz(a)anthracene	43.8%
4-methylphenol	26.6%

p-phenylenediamine	44.3%
hexachlorophene	62.7%

The non-detect results for aramite and hexachlorophene were previously rejected. The results for the other compounds in sample GDEHW04D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in method blank SBLK1. The positive result for this compound in sample GDEHW04D03 was greater than 10X the blank amount, so no action was required.

Field Blank:

There were no positive detections in the field blank which was analyzed in SDG 27464B. No action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of nitrobenzene-d5 (145%) and 2,4,6-tribromophenol (132%) exceeded their respective 34-114% and 10-123% QC limits in sample GDEHW04D03. Since only one surrogate recovery was outside the QC limits in each of the acid and base/neutral fractions, no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. Several Percent Recoveries were outside their QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for field duplicate samples GDEHW04D03 and GDEGW04D03 (analyzed in SDG 27464B), so no action was required.

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 aramite and hexachlorophene were rejected in sample GDEHW04D03 based on low RRF's in the initial calibration. 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 Difference (%D) was 25.3% for alpha-BHC in the standards analyzed on 11/05/96 at 09:29 on the primary column, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample GDEHW04D03 was flagged as estimated (UJ).

The Percent Differences (%D's) were 26.1% for both alpha-BHC and beta-BHC in the standards analyzed on 11/06/96 at 05:42 on the primary column. This exceeded the 25% QC limit. The non-detect results for these compounds in associated sample GDEHW04D03 were flagged as estimated (UJ).

III.) Calibration:

All Initial and 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.

Field Blanks:

There were no positive detections in the field blank, which was analyzed in SDG 27464B. No action was necessary.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of tetrachloro-m-xylene (TCX) on Column #1 was 158% for sample GDEHW04D03, which exceeded the 30-150% QC limits. No action was required since there were no positive results for this sample.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples GDEHW04D03 and GDEGW04D03 (analyzed in SDG 27464B). No action was necessary.

IX.) 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.

X.) 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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Limit
065FW00701	beryllium	0.38 ug/L	1.90 ug/L
PBW	thallium	4.80 ug/L	24.0 ug/L
CCB2	vanadium	0.60 ug/L	3.00 ug/L
CCB1	cyanide	3.40 ug/L	17.0 ug/L

CCB = Continuing Calibration Blank, PBW= Preparation Blank (Water),
065FW00701 = Field Blank (analyzed in SDG 27464B)

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 or field 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.
PBW	calcium	-19.4 ug/L	97.0 ug/L
CCB4	copper	-0.60 ug/L	3.00 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 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	7 ug/L
chromium	1 ug/L
nickel	3 ug/L
selenium	5 ug/L

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

action was required.

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

antimony	-6 ug/L
barium	-1 ug/L
cadmium	-2 ug/L
copper	-2 ug/L
silver	-7 ug/L
vanadium	-1 ug/L

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

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria was met. No action was required.

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 required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed for this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 596HW00103 and 596GW00103 (analyzed in SDG 27464B) and GDEHW04D03 and GDEGW04D03 (analyzed in SDG 27464B), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	596GW00103, ug/L	596HW00103, ug/L	RPD
aluminum	74.5	85.8	14
arsenic	12.4	13.3	7.0
calcium	82900	82300	0.7
iron	8360	8280	0.9
magnesium	14000	14100	0.7
manganese	233	231	0.8
potassium	10700	10800	0.9
sodium	71600	72300	0.9

None of the RPD's exceeded the 30% QC limit for water samples, so no action was required.

Analyte	GDEGW04D03, ug/L	GDEHW04D03, ug/L	RPD
barium	63.6	66.3	4.2
calcium	218000	222000	1.8
cobalt	1.2	1.3	8.0
copper	0.6	3.4	140
iron	58.3	63.3	8.2
magnesium	252000	262000	3.8
manganese	358	368	2.8
nickel	3.3	7.4	77
potassium	26900	27500	2.2
sodium	1570000	165000	5.0

The RPD's for copper and nickel exceeded the 30% QC limit for water samples. The positive results for these two analytes in these two 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 in the method blanks. No action was necessary.

Field Blank:

Chlorides were not detected in the field blank (analyzed in SDG 27464B). 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. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples GDEHW04D03 and GDEGW04D3 (analyzed in SDG 27464B) was 0.3%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for field duplicate samples 596HW00103 and 596GW00103 (analyzed in SDG 27464B) was not calculable. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without 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:

There were no positive detections in the method blanks. No action was necessary.

Field Rinsate Blank:

Sulfates were not detected in the field blank (analyzed in SDG 27464B). 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. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates in field duplicate samples GDEHW04D03 and GDEGW04D3 (analyzed in SDG 27464B) was 0.5%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for sulfates in field duplicate samples 596HW00103 and 596GW00103 (analyzed in SDG 27464B) was 3.6%, which 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 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:

TDS was not detected in the method blanks. No action was necessary.

Field Blank:

TDS was not detected in the field blank (analyzed in SDG 27464B). 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. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS in field duplicate samples GDEHW04D03 and GDEGW04D3 (analyzed in SDG 27464B) was 7.5%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for TDS in field duplicate samples 596HW00103 and 596GW00103 (analyzed in SDG 27464B) was 8.5%, which 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 qualifications.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27464B CLP Organics and Inorganics

SAMPLES: 065GW00701, 065FW00701, 065TW00701, 065GW00801, 016GW01D03, 596GW00103, 596GW00203, 596GW00303, 596GW01D03, GDEGW02801, GDEGW02801MS, GDEGW02801MSD, GDEGW03D03, GDEGW04D03, GDETW04D03, GDEGW05D03, GDEGW06D03, GDEGW28D01, GDEGW28D01RE

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) was 39.3% for acetone in the standards analyzed on 10/11/96 on instrument K, which exceeded the 30% QC limit. There were no positive results for this compound in the associated samples after blank qualification, so no action was required.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.037 for the standard analyzed on 11/04/96 at 09:35 on instrument K, which was below the 0.050 QC limit. The results for this compound in the associated samples and blanks, which consisted entirely of non-detects, were rejected (R). The associated samples and blanks were 065GW00701, 065TW00701, 065FW00701, 065GW00801, GDEGW03D03, GDEGW04D03, GDETW04D03, GDEGW05D03, GDEGW06D03 and GDEGW28D01.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/04/96 at 09:35 on instrument K for the following compounds:

2-chloroethyl vinyl ether	47.1%
bromomethane	34.2%
vinyl acetate	40.1%

The results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. The results for the other compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 065GW00701, 065GW00801,

GDEGW03D03, GDEGW04D03, GDEGW05D03, GDEGW06D03 and GDEGW28D01.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Field Blank:

Acetone, methylene chloride, chloroform, bromodichloromethane and dibromochloromethane were detected at 6 ug/L, 7 ug/L, 4 ug/L, 2 ug/L and 2 ug/L, respectively, in field blank 065FW00701. The positive results for acetone and methylene chloride in the associated samples were previously flagged based on the trip blanks. There were no positive results for the other compounds in the associated samples. No action was required.

Trip Blanks:

Acetone and methylene chloride were detected at 8 ug/L and 7 ug/L, respectively, in trip blank GDETW04D03. All positive results for these compounds in associated samples GDEGW03D03, GDEGW04D03, GDEGW05D03, GDEGW06D03, GDEGW02801 and GDEGW28D01 less than 10X the blank amounts were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL.

Acetone and methylene chloride were detected at 7 ug/L and 8 ug/L, respectively, in trip blank 065TW00703. All positive results for these compounds in associated samples 065GW00701 and 065GW00801 less than 10X the blank amounts were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL.

TIC's:

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

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.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this

fraction in this SDG, so no action was required.

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 in all samples in this SDG were rejected based on low RRF's in the continuing calibrations. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

The 10 days between sample date and extraction date for sample GDEGW28D01RE exceeded the 7 day QC limit for water samples. The original analysis of this sample was selected for validation. No further action was required.

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) was 43.6% for hexachlorocyclopentadiene in the standards analyzed on 11/07/96 on instrument S, which exceeded the 30% QC limit. There were no positive results for this compound in the associated samples. No action was required.

The Percent Relative Standard Deviation (%RSD) was 68.8% for hexachlorocyclopentadiene in the standards analyzed on 11/14/96 on instrument S, which exceeded the 30% QC limit. No action was required, since there were no positive results for this compound in the associated samples.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/06/96 at 09:11 on instrument S for 2,4-dinitrophenol (47.9%) and 4,6-dinitro-2-methylphenol (28.1%). The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDEGW03D03, GDEGW05D03, GDEGW06D03, GDEGW04D03, 065GW00701 and 065GW00801.

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in method blank SBLK1. All positive results for this compound in associated samples 065GW00701, 065GW00801, GDEGW02801, GDEGW03D01 and GDEGW04D03, 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.

Field Blanks:

There were no positive detections in the field blanks for this SDG. No action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) exceeded the 35-114% QC limits for nitrobenzene-d5 in the following samples:

Client Sample #	%R
GDEGW03D03	118
GDEGW05D03	120
GDEGW06D03	116
GDEGW04D03	132
065GW00701	128

Since only one surrogate %R exceeded the QC limits for each sample in the base/neutral fraction, no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Differences (%RPD's) exceeded their respective QC limits for spiked samples

GDEGW02801MS and GDEGW02801MSD for the following compounds:

Compound	RPD	QC Limits
phenol	82	42%
2-chlorophenol	86	40%
1,4-dichlorobenzene	91	28%
n-nitroso-di-n-propylamine	89	38%
1,2,4-trichlorobenzene	83	28%
4-chloro-3-methylphenol	80	42%
acenaphthene	86	31%
2,4-dinitrotoluene	103	38%
4-nitrophenol	100	50%
pentachlorophenol	88	50%
pyrene	80	31%

The results for these compounds in unspiked sample GDEGW02801, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Recoveries (%R's) were outside their respective QC limits for spiked samples GDEGW02801MS and GDEGW02801MSD for the following compounds:

Compound	MS, %R	MSD, %R	QC Limits
1,4-dichlorobenzene		28	36-97%
n-nitroso-di-n-propylamine		27	41-116%
1,2,4-trichlorobenzene		29	39-98%
acenaphthene		30	46-118%
4-nitrophenol	90		10-80%

All results for these compounds in unspiked sample GDEGW02801 were previously flagged as estimated based on high RPD's. No further action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. Several Percent Recoveries were outside their QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (%RPD's) for the field duplicate samples in this fraction of the SDG, so no action was required.

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 original analysis of sample GDEGW28D01 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.

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 required.

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.

Field Blank:

There were no positive detections in the field blank. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

All LCS 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.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) 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.

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 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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Limit
065FW00701	beryllium	0.38 ug/L	1.90 ug/L
PBW	thallium	4.80 ug/L	24.0 ug/L
CCB2	vanadium	0.60 ug/L	3.00 ug/L

CCB = Continuing Calibration Blank, PBW= Preparation Blank (Water),
065FW00701 = Field 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, preparation or field 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.
PBW	calcium	-19.4 ug/L	97.0 ug/L
CCB4	copper	-0.60 ug/L	3.00 ug/L
CCB2	cyanide	-9.40 ug/L	47.0 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 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	7 ug/L
chromium	1 ug/L
nickel	3 ug/L
selenium	5 ug/L

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

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

antimony	-6 ug/L
barium	-1 ug/L
cadmium	-2 ug/L
copper	-2 ug/L
silver	-7 ug/L
vanadium	-1 ug/L

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

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed for this fraction. No action was required.

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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed for this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 596GW00103 and 596HW00103 (analyzed in SDG 27464A) and GDEGW04D03 and GDEHW04D03 (analyzed in SDG 27464A), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	596GW00103, ug/L	596HW00103, ug/L	RPD
aluminum	74.5	85.8	14
arsenic	12.4	13.3	7.0
calcium	82900	82300	0.7
iron	8360	8280	0.9
magnesium	14000	14100	0.7
manganese	233	231	0.8
potassium	10700	10800	0.9
sodium	71600	72300	0.9

None of the Relative Percent Differences (RPD's) exceeded the 30% QC limit for water samples, so no action was required.

Analyte	GDEGW04D03, ug/L	GDEHW04D03, ug/L	RPD
barium	63.6	66.3	4.2
calcium	218000	222000	1.8
cobalt	1.2	1.3	8.0
copper	0.6	3.4	140
iron	58.3	63.3	8.2
magnesium	252000	262000	3.8
manganese	358	368	2.8
nickel	3.3	7.4	77
potassium	26900	27500	2.2
sodium	1570000	165000	5.0

The RPD's for copper and nickel exceeded the 30% QC limit for water samples. The positive results for the two analytes in the two 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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.

Field Blank:

Chlorides were not detected in the field blank 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):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides in field duplicate samples GDEGW04D03 and GDEHW04D3 (analyzed in SDG 27464A) was 0.3%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for field duplicate samples 596GW00103 and 596HW00103 (analyzed in SDG 27464A) was not calculable. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was necessary.

Field Blank:

Sulfates were not detected in the field blank. 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) for sulfates in field duplicate samples GDEGW04D03 and GDEHW04D3 (analyzed in SDG 27464A) was 0.5%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for sulfates in field duplicate samples 596GW00103 and 596HW00103 (analyzed in SDG 27464A) was 3.6%, which 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 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:

TDS was not detected in the method blanks. No action was necessary.

Field Blank:

Chlorides were not detected in the field blank 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):

MS / MSD analyses were not performed for this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS in field duplicate samples GDEGW04D03 and GDEHW04D3 (analyzed in SDG 27464A) was 7.5%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for TDS in field duplicate samples 596GW00103 and 596W00103 (analyzed in SDG 27464A) was 8.5%, which 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.

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:	0154
CONTRACTED LAB:	Southwest Laboratory of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III and 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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27478A (Level IV) 27478B (Level III)

SAMPLES:

SDG 27478A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
596DW00403	27479.01	Water	X	X	X	X
596EW00403	27479.02	Water	X	X	X	X
596FW00403	27479.03	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Chloride	Sulfate	TDS	Cyanide
596DW00403	27479.01	Water	X	X	X	X
596EW00403	27479.02	Water	X	X	X	X
596FW00403	27479.03	Water	X	X	X	X

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK

SDG 27478B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
596GW04D03	27478.01	Water				X
596GW00403	27478.02	Water				X
GDEGW00403	27478.03	Water	X	X	X	X
GDEGW00603	27478.04	Water	X	X	X	X
GDEGW02701	27478.08	Water	X	X	X	X
GDEGW27D01	27478.09	Water	X	X	X	X
GDEGW03001	27478.06	Water	X	X	X	X
GDEGW30D01	27478.07	Water	X	X	X	X
GDETW00603	27478.05	Water	X			
GDETW30D01	27478.12	Water	X			
GDEGW27D01MS	27478.10	Water	+	+	+	+
GDEGW27D01MSD	27478.11	Water	+	+	+	+

Client Sample #	Lab Sample #	Matrix	Chloride	Sulfate	TDS	Cyanide
596GW04D03	27478.01	Water	X	X	X	
596GW00403	27478.02	Water	X	X	X	
GDEGW00403	27478.03	Water	X	X	X	X
GDEGW00603	27478.04	Water	X	X	X	X
GDEGW02701	27478.08	Water	X	X	X	X
GDEGW27D01	27478.09	Water	X	X	X	X
GDEGW03001	27478.06	Water	X	X	X	X
GDEGW30D01	27478.07	Water	X	X	X	X
GDEGW27D01MS	27478.10	Water	+	+		+
GDEGW27D01MSD	27478.11	Water	+	+		+

+ = Non-billable analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE:

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 27478A Appendix IX, CLP Organics and Inorganics

SAMPLES: 596DW00403, 596EW00403, 596FW00403

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 (0.043), trans-1,4-dichloro-2-butene (0.049), acetonitrile (0.021), isobutyl alcohol (0.006) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the initial calibration analyzed on 11/01/96 on instrument R. The non-detect results for these compounds in the associated equipment rinsate, field and deionized water blanks were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for acrolein (0.045), acetonitrile (0.024), isobutyl alcohol (0.009) and 1,4-dioxane (0.004) were below the 0.050 QC limit for standard analyzed on 9/19/96 at 14:24 on instrument R. The results for these compounds in the associated equipment rinsate, field and deionized water blanks were previously rejected due to very low RRF's in the initial calibration. No further action was taken.

IV.) Blanks:

Method Blanks:

Methylene chloride (5 ug/L) and acetone (4 ug/L) were detected in the method blank VBLK1. Since the only associated samples were field blanks, no action was required.

Equipment Rinsate Blank:

Methylene chloride (7 ug/L), acetone (2 ug/L) and chloroform (2 ug/L) were detected in equipment rinsate blank 596EW00403. No action was required for the field and deionized water blanks associated with this blank

Field Blank:

Methylene chloride (9 ug/L), acetone (8 ug/L) and chloroform (1 ug/L) were detected in field blank 596FW00403. Since only equipment rinsate and deionized water blanks were associated with this blank, no action was required.

Deionized Water Blank:

Methylene chloride (8 ug/L), acetone (7 ug/L) and chloroform (1 ug/L) were detected in deionized water blank 596DW00403. Since only equipment rinsate and field blanks were associated with this blank, no 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):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples analyzed in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples designated 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 acrolein, trans-1,4-dichloro-2-butene, acetonitrile, 1,4-dioxane and isobutyl alcohol were rejected in all blanks in this SDG because of low RRF's in the initial calibration. The other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met, so 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 (0.049) and hexachlorophene (0.037) in the standards analyzed on 11/14/96 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene in all associated samples were rejected (R).

Continuing Calibration:

The average Relative Response Factors (RRF's) for aramite (0.048) and hexachlorophene (0.014) in the standards analyzed on 11/18/96 at 09:10 on instrument A were below the 0.050 QC limit. The non-detect results for aramite and hexachlorophene were previously rejected in the samples based on low RRF's in the initial calibration. No further action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in method blank SBLK1, no action was taken.

Field Blanks:

There were no positive detections in the equipment rinsate, field and deionized water blank. No action was taken.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met, no action was required.

VI.) Laboratory Control Samples (LCS):

All LCS 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 necessary.

VIII.) Field Duplicates:

There were no field duplicate samples designated 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 necessary.

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 in this SDG because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable without qualification.

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:

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.

Field Blanks:

There were no positive detections in the equipment rinsate, field and deionized water blanks. No action was necessary.

V.) Surrogate Recoveries:

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

VI.) Laboratory Control Samples (LCS):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples designated in this SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG. No action was taken.

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 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 required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	2.96 ug/L	14.8 ug/L
CCB1	arsenic	2.60 ug/L	13.0 ug/L
PBW	calcium	33.6 ug/L	168 ug/L
PBW	cobalt	1.07 ug/L	5.35 ug/L
FW	copper	4.20 ug/L	21.0 ug/L
CCB4	lead	1.70 ug/L	8.50 ug/L
FW	nickel	9.00 ug/L	45.0 ug/L
PBW	silver	5.28 ug/L	26.4 ug/L
CCB3	thallium	2.90 ug/L	14.5 ug/L
PBW	zinc	7.70 ug/L	38.5 ug/L
CCB4	cyanide	3.90 ug/L	19.5 ug/L

CCB = Continuing Calibration Blank, FW = Field Blank, PBW = Preparation Blank (Water)

Only field blanks were associated with these blanks in this SDG. No action was required.

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

Blank ID	Analyte	Neg. Conc.	5X Conc.
CCB4	copper	-35.7 ug/L	178.5 ug/L
ICB	cyanide	-3.50 ug/L	17.5 ug/L

ICB - Initial Calibration Blank, CCB = Continuing Calibration Blank

Since only field blanks were associated with these blanks in this SDG, 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:

chromium	2 ug/L
selenium	6 ug/L
thallium	9 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium 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	-3 ug/L
silver	-3 ug/L
vanadium	-4 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

V.) ICP Serial Dilution Analysis:

The ICP 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:

There were no MS / MSD samples designated in this SDG. No action was necessary.

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 without qualification.

CHLORIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All 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.

Field Blanks:

There were no positive detections in the equipment rinsate, field and deionized water 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 of the SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not designated in this SDG, so no action was taken.

VII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. No action was required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SULFATES

I.) Holding Times:

All Holding Time criteria were met, so no action was taken.

II.) Calibration:

All Calibration criteria were met, so no action was taken.

III.) Blanks:

Method Blanks:

Sulfates were not detected in the method blanks. No action was necessary.

Equipment Rinsate Blank:

Sulfates were not detected in the equipment rinsate blank, no action was taken.

Field Blank:

Sulfates were detected at 0.3 mg/L in the field blank. Since only field blanks were in this SDG, no action was required.

Deionized Water Blank:

Sulfates were detected at 3.2 mg/L in the deionized water blank. Since only the field blanks were 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.) Duplicate Sample Analysis:

Duplicate Sample analysis was not performed for this SDG, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not designated in this SDG, so no action was taken.

VII.) Field Duplicates:

There were no field duplicate samples designated in this SDG. 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 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.

Field Blanks:

TDS was not detected in the equipment, field and deionized water 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:

Duplicate Sample Analysis was not performed in this SDG. 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:

There were no field duplicate samples designated in this SDG. 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. - 27478B Level III, CLP Organics and Inorganics

SAMPLES: 596GW04D03, 596GW00403, GDEGW00403, GDEGW00603, GDEGW02701, GDEGW27D01, GDEGW03001, GDEGW30D01, GDETW00603, GDETW30D01, GDEGW27D01MS, GDEGW27D01MSD

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 standard analyzed on 11/01/96 on instrument R for the following compounds:

chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%

Since these compounds were not detected 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 11/04/96 at 09:54 on instrument R for the following compounds:

chloroethane	25.5%
vinyl acetate	42.8%
2-chloroethyl vinyl ether	52.7%

The results for these compounds in associated samples GDEGW00403, GDEGW00603, GDEGW02701, GDEGW03001 and GDEGW30D01, 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 11/05/96 at 10:11 on instrument R for the following compounds:

chloroethane	33.5%
2-chloroethyl vinyl ether	36.3%

The non-detect results for these compounds in associated sample GDEGW27D01 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride (5 ug/L) and acetone (4 ug/L) were detected in the method blank VBLK1. Since field blank 596FW00403 (analyzed in SDG 27478A) was used for blank qualifications, no further action was required.

Methylene chloride (13 ug/L) and acetone (8 ug/L) were detected in the method blank VBLK2. Since field blank 596FW00403 (analyzed in SDG 27478A) was used for blank qualifications, no further action was required.

Equipment Rinsate Blank:

Methylene chloride (7 ug/L), acetone (2 ug/L) and chloroform (2 ug/L) were detected in equipment rinsate blank 596EW00403, which was analyzed in SDG 27478A. Since field blank 596FW00403 (analyzed in SDG 27478A) was used for blank qualifications, no further action was required.

Field Blank:

Methylene chloride (9 ug/L), acetone (8 ug/L) and chloroform (1 ug/L) were detected in field blank 596FW00403, which was analyzed in SDG 27478A. Detections of methylene chloride and acetone in the associated samples less than 10X the blank amounts and associated positive sample detections of chloroform less than 5X the blank amount were flagged as undetected (U) with analytical results below the CRQL being replaced with the CRQL.

Deionized Water Blank:

Methylene chloride (8 ug/L), acetone (7 ug/L) and chloroform (1 ug/L) were detected in deionized water blank 596DW00403 (analyzed in SDG 27478A). Since field blank 596FW00403 was used for blank qualifications, no further action was required.

Trip Blanks:

Methylene chloride (5 ug/L) and acetone (3 ug/L) were detected in trip blank GDETW00603. Since field blank 596FW00403 (analyzed in SDG 27478A) was used for blank qualifications, no further action was required.

Methylene chloride (8 ug/L) and acetone (3 ug/L) were detected in trip blank GDETW30D01. Since

field blank 596FW00403 (analyzed in SDG 27478A) was used for blank qualifications, 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):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met, so no action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples designated 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 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 taken.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) of benzo(k)fluoranthene was 50.3%, which exceeded the 30% QC limit, for the standards analyzed on 10/29/96 on instrument V. Since there were no positive results for this compound in associated samples, no action was taken.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/07/96 at 09:55 on instrument V for the following compounds:

hexachlorocyclopentadiene	28.7%
3,3'-dichlorobenzidine	26.8%

The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDEGW00403, GDEGW00603 and GDEGW03001.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/08/96 at 09:24 on instrument V for the following compounds:

indeno(1,2,3-cd)pyrene	40.2%
dibenz(a,h)anthracene	41.4%
benzo(g,h,i)perylene	59.6%

The non-detect results for these compounds in associated samples GDEGW30D01, GDEGW02701 and GDEGW27D01 were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank, no action was required.

Field Blanks:

There were no positive detections in equipment rinsate, field and deionized water blanks which were analyzed in SDG 27478A. No action was taken.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

All LCS criteria were met. No action was necessary.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met, so no action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples designated 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:

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 taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was required.

Field Blanks:

There were no positive detections in the equipment rinsate, field and deionized water blanks, which were analyzed in SDG 27478A. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Samples (LCS):

All LCS criteria were met. 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 sample GDEGW27D01MS for the following compounds:

Compound	MS, %R	QC Limits
endosulfan I	43%	46-134%
4,4'-DDE	45%	70-122%
4,4'-DDD	45%	70-133%

The non-detect results for these compounds in unspiked sample GDEGW27D01 were flagged as estimated (UJ).

The Relative Percent Differences (RPD's) exceeded their respective QC limits in spiked samples GDEGW27D01MS and GDEGW27D01MSD for following compounds:

Compound	RPD	QC Limit
alpha-BHC	36%	20%
beta-BHC	40%	20%
gamma-BHC	39%	15%
delta-BHC	39%	20%
heptachlor	42%	20%
aldrin	45%	22%
heptachlor epoxide	44%	20%
endosulfan I	42%	20%
4,4'-DDE	45%	20%
dieldrin	42%	18%
endrin	40%	21%
endosulfan II	42%	20%
4,4'-DDD	43%	20%
endosulfan sulfate	39%	20%
4,4'-DDT	38%	27%
endrin aldehyde	43%	20%
methoxychlor	38%	20%
alpha-chlordane	41%	20%
gamma-chlordane	42%	20%
endrin ketone	39%	20%

The non-detect results for these compounds in unspiked sample GDEGW27D01 were flagged as estimated (UJ).

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 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 cleanup was not required for water samples. 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:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	2.96 ug/L	14.8 ug/L
CCB1	arsenic	2.60 ug/L	13.0 ug/L
PBW	calcium	33.6 ug/L	168 ug/L
PBW	cobalt	1.07 ug/L	5.35 ug/L
FW	copper	4.20 ug/L	21.0 ug/L
CCB4	lead	1.70 ug/L	8.50 ug/L
FW*	nickel	9.00 ug/L	45.0 ug/L
PBW	silver	5.28 ug/L	26.4 ug/L
CCB3	thallium	2.90 ug/L	14.5 ug/L
PBW	zinc	7.70 ug/L	38.5 ug/L
CCB4	cyanide	3.90 ug/L	19.5 ug/L

* Field blank 596FW00403 was analyzed in SDG 27478A.

CCB = Continuing Calibration Blank, FW = Field 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, field or preparation blank were flagged as undetected (U).

Copper had a negative result (-35.7 ug/L) with an absolute value greater than the IDL in the fourth continuing calibration blank. All associated positive sample results less than 5X the absolute value of the negative blank result (178.5 ug/L) 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
nickel	2 ug/L
thallium	6 ug/L

These analytes should not be present. Since neither aluminum, calcium, iron nor magnesium 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:

antimony	-6 ug/L
cadmium	-3 ug/L
copper	-2 ug/L
vanadium	-2 ug/L

Since neither aluminum, calcium, iron nor magnesium was detected at a concentration comparable to or greater than that of ICS Solution A, no action was taken.

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:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of iron were 70.7% and 70.6%, respectively, in spiked samples GDEGW27D01MS and GDEGW27D01MSD, which were below the 75-125% QC limits. All positive and non-detect results for iron in all associated water samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

There were no field duplicate samples designated in this SDG. 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.

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:

There were no positive detections in the equipment rinsate, field and deionized water 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 of the SDG, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD 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 required.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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:

There were no positive detections in the method blanks. No action was necessary.

Equipment Rinsate Blank:

Sulfates were not detected in the equipment rinsate blank which was analyzed in SDG 27478A, no action was taken.

Field Blank:

Sulfates were detected at 0.3 mg/L in field blank 596GW00403, which was analyzed in SDG 27478A. Sulfates were flagged using the deionized water blank. No further action was taken.

Deionized Water Blank:

Sulfates were detected at 3.2 mg/L in the deionized water blank 596DW00403, which was analyzed in SDG 27478A. Detections of sulfates in the associated water samples less than 5X the blank amount were flagged as undetected (U).

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 of the SDG, so no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD 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 required.

VIII.) 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:

TDS was not detected in the method blanks. No action was necessary.

Field Blanks:

TDS was not detected in the equipment, field and deionized water blanks which were analyzed in SDG 27478A. 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:

Duplicate Sample Analysis was not performed in this fraction of the SDG. 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:

There were no field duplicate samples designated in this SDG. 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:	0157
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
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: 27488A (Level IV)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	PCDD/ PCDF
GDEGW02901	27489.01	Water	X

DATA REVIEWER(S): Shawn S. Lin, Ph.D., Jean M. Delashmit

RELEASE SIGNATURE:

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27488A 2,3,7,8-substituted PCDD's and PCDF's

SAMPLE: GDEGW02901

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:

Four 2,3,7,8-substituted PCDD's and PCDF's were detected in method blank at the following concentrations:

Method Blank	Compound	Conc. pg/L	Action Level pg/L
DFBLK1	OCDD	13	65
	234678-HxCDF	3.0	15
	1234678-HpCDF	2.8	14
	OCDF	3.4	17

Detections of these compounds in associated samples below 5X the blank amounts were designated as Estimated Maximum Possible Concentration (EMPC).

Field Blanks:

No field blanks were analyzed. No action was required.

V.) Internal Standards Performance:

All criteria were met, so no action was taken.

VI.) Spike/Spike Duplicates:

No MS/MSD set was analyzed in this SDG. No action was required.

VII.) Duplicates:

No field duplicate set was analyzed in this SDG. No action was required.

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:

Sample ID "GDWHW02901" on the spreadsheet was changed by the validator to read "GDEGW02901" to match the Chain-of-Custody record.

All 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:	0157
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Levels III & IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Organophosphorus Pesticides, Chlorinated Herbicides, Total Metals, Cyanide, Hexavalent Chromium (HexaCr), Chloride, Sulfate, Total Dissolved Solids (TDS)
SDG NUMBERS:	27488A (Level IV) 27488B (Level III)

SAMPLES:

SDG 27488A (Level IV)

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Organophos. Pesticides
GDEHW02901	27489.01	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Herbicides	Total Metals	Cyanide	HexaCr
GDEHW02901*	27489.01	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
GDEHW02901*	27489.01	Water	X	X	X

* = Field duplicate was associated with sample GDEGW02901 in SDG 27488B.

SDG 27488B (Level III)

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
097GW00103	27507.03	Water				X
100GW00103	27488.07	Water				X
102GW00103	27507.01	Water				X
570GW00401	27488.09	Water	X	X	X	X
583GW00103	27507.04	Water				X
586GW00103	27507.02	Water				X
590GW00103	27488.05	Water				X
570GW01D03	27488.06	Water				X
GDEGW00303	27488.01	Water	X	X	X	X
GDEGW00903	27488.03	Water	X	X	X	X
GDEGW02901*	27488.11	Water	X	X	X	X
GDEGW07D03	27507.05	Water	X	X	X	X
GDEGW09D03	27488.04	Water	X	X	X	X
GDEGW29D01	27488.08	Water	X	X	X	X
570TW00401	27488.10	Water	X			
GDETW00303	27488.02	Water	X			
GDETW07D03	27507.06	Water	X			
GDEGW02901MS	27488.11MS	Water	+			
GDEGW02901MSD	27488.11MSD	Water	+			
GDEGW00303MS	27488.01MS	Water		+		
GDEGW00303MSD	27488.01MSD	Water		+		
570GW00401MS	27488.09MS	Water			+	
570GW00401MSD	27488.09MSD	Water			+	

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
097GW00103	27507.03	Water		X	X	X
100GW00103	27488.07	Water		X	X	X
102GW00103	27507.01	Water		X	X	X
570GW00401	27488.09	Water	X	X	X	X
583GW00103	27507.04	Water		X	X	X
586GW00103	27507.02	Water		X	X	X
590GW00103	27488.05	Water		X	X	X
570GW01D03	27488.06	Water		X	X	X
GDEGW00303	27488.01	Water	X	X	X	X
GDEGW00903	27488.03	Water	X	X	X	X
GDEGW02901*	27488.11	Water	X	X	X	X
GDEGW07D03	27507.05	Water	X	X	X	X
GDEGW09D03	27488.04	Water	X	X	X	X
GDEGW29D01	27488.08	Water	X	X	X	X

* = Field duplicate was associated with sample GDEHW02901 in SDG 27488A.

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27488 Appendix IX CLP Organics and Inorganics

SAMPLE: GDEHW02901

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 11/01/96 on instrument R for the following compounds:

acrolein	0.043
trans-1,4-dichloro-2-butene	0.049
acetonitrile	0.021
isobutyl alcohol	0.006
1,4-dioxane	0.002

The results for these compounds in associated sample GDEHW02901, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 11/01/96 on instrument R exceeded the 30% QC limit for the following compounds:

trans-1,4-dichloro-2-butene	52.8%
bromomethane	30.2%
chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%
dichlorodifluoromethane	38.7%

The non-detect result for trans-1,4-dichloro-2-butene was previously rejected because of a low RRF in

this calibration. Since there were no positive results for the other compounds in the associated sample, no further action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 11/04/96 at 09:54 on instrument R for the following compounds:

acrolein	0.045
acetonitrile	0.023
isobutyl alcohol	0.007
1,4-dioxane	0.002

The results for these compounds in the associated sample were previously rejected based on low RRF's in the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/04/96 at 09:54 on instrument R for the following compounds:

chloroethane	25.5%
vinyl acetate	42.8%
2-chloroethyl vinyl ether	52.7%
trans-1,4-dichloro-2-butene	46.9%
dichlorodifluoromethane	36.2%

The non-detect result for trans-1,4-dichloro-2-butene was previously rejected because of a low RRF in the initial calibration. The results for the other compounds in associated sample GDEHW02901, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Acetone and methylene chloride were detected at 4 ug/L and 5 ug/L, respectively, in method blank VBLK1. The positive results for these compounds in associated sample GDEHW02901, which were less than 10X the blank amounts, were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL.

TIC's:

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

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.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. One Percent Recovery (%R) was outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples for this SDG. No action was required.

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 acrolein, trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample GDEHW02901 based on 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, 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 11/14/96 on instrument A for aramite (0.045) and hexachlorophene (0.036). The non-detect results for these compounds in associated sample GDEHW02901 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 11/14/96 on instrument A for the following compounds:

methyl methanesulfonate	38.5%
n-nitrosomethylethylamine	30.3%
n-nitrosodiethylamine	31.8%
ethyl methanesulfonate	34.3%
acetophenone	35.3%
n-nitrosopyrrolidine	34.6%
2-picoline	40.8%
p-phenylenediamine	44.7%
m-cresol	32.7%
n-nitrosomorpholine	37.5%
o-toluidine	35.9%
n-nitroso-piperidine	33.7%
o,o,o-triethyl phosphorothionate	32.8%
2,6-dichlorophenol	36.3%
n-nitroso-di-n-butylamine	36.2%
hexachloropropene	39.4%
1,2,4,5-tetrachlorobenzene	36.7%
hexachlorocyclopentadiene	33.4%
safrole	35.0%
isosafrole	36.3%
1,4-naphthoquinone	40.3%
1,3-dinitrobenzene	32.0%
1-naphthylamine	38.0%
4-nitroquinoline-1-oxide	46.9%
2-napthylamine	36.1%
thionazin	34.6%
pentachlorobenzene	30.2%
pentachlorophenol	37.2%
diphenylamine	33.7%
sulfotepp	37.2%
1,3,5-trinitrobenzene	42.8%
phorate	44.8%
phenacetin	35.0%
diallate	30.6%
dimethoate	34.3%
4-aminobiphenyl	39.8%
pronamide	39.2%

pentachloronitrobenzene	34.2%
disulfoton	32.8%
methyl parathion	33.1%
parathion	35.7%
methapyrilene	44.9%
isodrin	36.1%
chlorobenzilate	36.1%
3,3'-dimethylbenzidine	43.4%
kepone	43.9%
famphur	65.0%
2-acetylaminofluorene	36.0%
7,12-dimethylbenz(a)anthracene	34.9%
hexachlorophene	49.0%

There were no positive results for these compounds in the associated sample. No action was required.

Continuing Calibration:

The Relative Response Factor (RRF) for hexachlorophene (0.022) was below the 0.050 QC limit for the standards analyzed on 11/15/96 at 08:33 on instrument A. The result for this compound in associated sample GDEHW02901 was 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 11/15/96 at 08:33 on instrument A for the following compounds:

methyl methanesulfonate	50.9%
n-nitrosomethylethylamine	57.8%
n-nitrosodiethylamine	52.0%
ethyl methanesulfonate	52.5%
acetophenone	50.6%
n-nitrosopyrrolidine	50.6%
n-nitrosomorpholine	49.0%
o-toluidine	55.7%
n-nitroso-piperidine	43.1%
o,o,o-triethyl phosphorothionate	51.5%
n-nitroso-di-n-butylamine	41.0%
safrole	48.3%
isosafrole	53.8%
1,4-naphthoquinone	51.9%
1,3-dinitrobenzene	94.2%
2,4-dinitrotoluene	31.9%
1-naphthylamine	48.4%
2-naphthylamine	54.1%
thionazin	63.2%
phorate	98.8%
phenacetin	50.0%
diallate	57.4%

dimethoate	72.4%
pronamide	53.4%
4-aminobiphenyl	53.5%
pentachloronitrobenzene	65.9%
disulfoton	64.9%
methyl parathion	72.8%
parathion	44.0%
methapyrilene	31.0%
isodrin	44.4%
chlorobenzilate	75.0%
3,3'-dimethylbenzidine	81.3%
m-cresol	32.6%
4-nitroquinoline-1-oxide	53.7%
diphenylamine	77.9%
sulfotepp	123%
7,12-dimethylbenz(a)anthracene	89.5%
p-phenylenediamine	104%
hexachlorophene	46.9%
famphur	123%
hexachloropropene	62.8%
1,2,4,5-tetrachlorobenzene	58.1%
pentachlorobenzene	56.5%

The non-detect result for hexachlorophene was previously rejected based on the initial calibration. The results for the other compounds in associated sample GDEHW02901, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 1 ug/L in method blank SBLK1. The analytical result for this compound in associated sample GDEHW02901, which was less than 10X the blank amount, was flagged as undetected (U) with the detection limit being raised to the CRQL.

TIC's:

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. Several Percent Recoveries were outside QC limits. Data validation action based on LCS criteria was not required. No action was taken.

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 required.

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 aramite and hexachlorophene were rejected in sample GDEHW02901 based on low RRF's in the initial calibration. 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 Instrument Performance criteria were met. No 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 required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification 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 in the SDG. No action was necessary.

IX.) 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.

X.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

ORGANOPHOSPHORUS PESTICIDES

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

All 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 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.) 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:

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. One Percent Recovery (%R) 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 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:

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:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

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

Blank ID	Analyte	Max. Conc.	Action Level
PBW	antimony	4.43 ug/L	22.2 ug/L
ICB	copper	2.00 ug/L	10.0 ug/L
PBW	silver	3.13 ug/L	15.6 ug/L

ICB = Initial 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:

Blank ID	Analyte	Neg. Conc.	5X Conc.
CCB3	beryllium	-0.50 ug/l	2.50 ug/L
CCB3	cobalt	-1.00 ug/L	5.00 ug/L
CCB4	thallium	-4.60 ug/L	23.0 ug/L
ICB	cyanide	-3.50 ug/L	17.5 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank

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	6 ug/L
chromium	2 ug/L
lead	4 ug/L
nickel	3 ug/L
selenium	8 ug/L
thallium	5 ug/L

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

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

antimony	-6 ug/L
barium	-1 ug/L
cadmium	-4 ug/L
vanadium	-2 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the 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 required.

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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed for this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, GDEGW02901 (analyzed in SDG 27488B) and GDEHW02901, was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEGW02901, ug/L	GDEHW02901, ug/L	RPD
aluminum	7540	2960	87.2
arsenic	205	15.4	28.4
barium	25.8	18.4	33.5
calcium	36000	37200	3.3
chromium	11	5.2	71.6
iron	14100	11300	22.0
lead	5.4	2.7	66.7
magnesium	16300	17300	5.9
manganese	58.2	56.3	3.3
nickel	3.7	1.5	84.6
potassium	13100	14100	7.4
sodium	83500	86200	3.2
vanadium	12.6	6.3	66.7
zinc	20.2	10.1	66.7

The RPD's exceeded the 30% QC limit for water samples for aluminum, barium, chromium, lead, nickel, vanadium and zinc. The positive results for these analytes in the two 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides in field duplicate samples GDEGW02901 (analyzed in SDG 27488B) and GDEHW02901 was 3.9%, which 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.

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:

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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates in field duplicate samples GDEGW02901 (analyzed in SDG 27488B) and GDEHW02901 was 8.4%, which 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 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:

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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS in field duplicate samples GDEGW02901 (analyzed in SDG 27488B) and GDEHW02901 was 7.5%, which 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 qualifications.

HEXAVALENT CHROMIUM (HexaCr)

I.) Holding Times:

The holding time from sample date to analysis date was 3 days for sample GDEHW02901, which exceeded the 24 hour QC limit. The non-detect result for hexavalent chromium in this sample was flagged as estimated (UJ).

II.) Calibration:

All Initial and Continuing Calibration criteria were met, so no action was taken.

III.) Blanks:

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 required.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VI.) Matrix Spike Recovery (MS):

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27488 CLP Organics and Inorganics

SAMPLES: 097GW00103, 100GW00103, 102GW00103, 570GW00401, 583GW00103, 586GW00103, 590GW00103, 570GW01D03, GDEGW00303, GDEGW00903, GDEGW02901, GDEGW07D03, GDEGW09D03, GDEGW29D01, 570TW00401, GDETW00303, GDETW07D03, 570GW00401MS, 570GW00401MSD, GDEGW00303MS, GDEGW00303MSD, GDEGW02901MS, GDEGW02901MSD

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) for the standards analyzed on 11/01/96 on instrument R exceeded the 30% QC limit for the following compounds:

bromomethane	30.2%
chlrooethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%

These compounds were not detected in the associated samples, so no action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/04/96 at 09:54 on instrument R for the following compounds:

2-chloroethyl vinyl ether	52.7%
chloroethane	25.5%
vinyl acetate	42.8%

The results for these compounds in the associated samples, which consisted entirely of non-detects,

were flagged as estimated (UJ). The associated samples were GDEGW00303, GDEGW00903, GDEGW09D03, GDEGW29D01 and 570GW00401.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/06/96 at 09:31 on instrument R for the following compounds:

methylene chloride	26.0%
2-chloroethyl vinyl ether	69.2%

The results for these compounds in associated sample GDEGW02901, which were both non-detects, were flagged as estimated (UJ).

The Percent Difference (%D) was 81.3% for 2-chloroethyl vinyl ether in the standards analyzed on 11/07/96 at 09:17 on instrument R, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample GDEGW07D03 was flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride and acetone were detected at 5 ug/L and 4 ug/L, respectively, in method blank VBLK1. All positive results for these compounds in the associated samples less than 10X the blank amount were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL. The associated samples were GDEGW00303, GDEGW00903, GDEGW09D03, GDEGW29D01 and 570GW00401.

Methylene chloride and acetone were detected at 10 ug/L and 6 ug/L, respectively, in method blank VBLK2. The positive results for these compounds in associated sample GDEGW02901, 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.

Acetone was detected at 10 ug/L in method blank VBLK3. There was no positive result for this compound in associated sample GDEGW07D03, so no action was required.

Trip Blanks:

Acetone and methylene chloride were detected at 3 ug/L and 7 ug/L, respectively, in trip blank GDETW00303. All positive results for these compounds in the associated samples were previously flagged based on the method blanks. No action was necessary.

Acetone and methylene chloride were detected at 8 ug/L and 32ug/L, respectively, in trip blank 570TW00401. All positive results for these compounds in the associated samples were previously flagged based on the method blanks. No action was required.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed in this SDG. Several Percent Recoveries (%R's) were outside their QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples, so no action was required.

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 required.

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 11/15/96 on instrument V for the following compounds:

1,2-dichlorobenzene	35.8%
naphthalene	34.1%
hexachlorocyclopentadiene	32.6%
acenaphthylene	31.1%
2,4-dinitrophenol	42.9%
4,6-dinitro-2-methylphenol	32.4%

These compounds were not detected in the associated samples, so no action was required.

The Percent Relative Standard Deviation (%RSD) was 35.4% for naphthalene in the standards analyzed on 11/18/96 on instrument T, which exceeded the 30% QC limit. There were no positive results for this compound in the associated samples, so no action was required.

The Percent Relative Standard Deviation (%RSD) was 32.2% for naphthalene for the standards analyzed on 11/22/96 on instrument V, which exceeded the 30% QC limit. There were no positive results for this compound in the associated samples, so no action was required.

Continuing Calibration:

All Continuing Calibration criteria were met. No action was required.

IV.) Blanks:

Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected at 2 ug/L and 1 ug/L, respectively, in method blank SBLK1. All positive results for these compounds in associated samples GDEGW00903, GDEGW29D01 and 570GW00401, which were less than 10X the blank amounts, were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL.

TIC's:

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of 4-nitrophenol in spiked samples GDEGW00303MS (82%) and GDEGW00303MSD (85%) exceeded the 10-80% QC limits. Since this compound was not detected in unspiked sample GDEGW00303, no action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (%RPD's) for the field duplicate samples in this fraction of the SDG, so no action was required.

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.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Recovery (%R) of 4,4'-DDT was 26.2% for the PEM standards analyzed on 11/08/96 at 01:31 on the primary column, which exceeded the 25% QC limit. The non-detect results for this compound in associated samples GDEGW02901 and GDEGW07D03 were flagged as estimated (UJ).

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 required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification 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.) 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.

X.) 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. No action was required.

III.) Blanks:

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

Blank ID	Analyte	Max. Conc.	Action Level
PBW	antimony	4.43 ug/L	22.2 ug/L
ICB	copper	2.00 ug/L	10.0 ug/L
PBW	silver	3.13 ug/L	15.6 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:

Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	beryllium	-0.50 ug/L	2.50 ug/L
CCB3	cobalt	-1.00 ug/L	5.00 ug/L
CCB4	thallium	-4.60 ug/L	23.0 ug/L
CCB1	cyanide	-4.30 ug/L	21.5 ug/L

CCB = Continuing Calibration Blank

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	6 ug/L
chromium	2 ug/L
lead	4 ug/L
nickel	3 ug/L
selenium	8 ug/L
thallium	5 ug/L

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

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

antimony	-6 ug/L
barium	-1 ug/L
cadmium	-4 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

The Percent Difference (%D) was 59.9% for manganese in the Serial Dilution Analysis for this SDG. Since this %D exceeded the 10% QC limit, all positive results for manganese in the associated 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 for this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed for this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, GDEGW02901 and GDEHW02901 (analyzed in SDG 27488A), was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEGW02901, ug/L	GDEHW02901, ug/L	RPD
aluminum	7540	2960	87.2
arsenic	205	15.4	28.4
barium	25.8	18.4	33.5
calcium	36000	37200	3.3
chromium	11	5.2	71.6
iron	14100	11300	22.0
lead	5.4	2.7	66.7
magnesium	16300	17300	5.9
manganese	58.2	56.3	3.3
nickel	3.7	1.5	84.6
potassium	13100	14100	7.4
sodium	83500	86200	3.2
vanadium	12.6	6.3	66.7
zinc	20.2	10.1	66.7

The RPD's exceeded the 30% QC limit for water samples for aluminum, barium, chromium, lead, nickel, vanadium and zinc. The positive results for these analytes in the two 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides in field duplicate samples GDEGW02901 and GDEHW02901 (analyzed in SDG 27488A) was 3.9%, which 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.

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:

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 for this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates in field duplicate samples GDEGW02901 and

GDEHW02901 (analyzed in SDG 27488A) was 8.4%, which 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 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 for this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The calculable Relative Percent Difference (RPD) for TDS in field duplicate samples GDEGW02901 and GDEHW02901 (analyzed in SDG 27488A) was 7.5%, which 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.

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:	0158
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Levels III & IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27513A (Level IV) 27513B (Level III)

SDG 27513A (Level IV)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Total Metals	Chlorides	Sulfates	TDS
145HW00203*	27531.01	Water	X	X	X	X
580HW00203*	27531.02	Water	X	X	X	X

* = Field duplicates were associated with samples 145GW00203 and 580GW00203 in SDG 27513B.

SDG 27513B (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
145GW00103	27530.06	Water				X
145GW00203*	27530.10	Water				X
145GW00303	27513.08	Water				X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
145GW01D03	27530.07	Water				X
580GW00203*	27530.11	Water				X
583GW00203	27513.01	Water				X
583GW00303	27513.03	Water				X
583GW02D03	27513.02	Water				X
GDEGW00703	27513.04	Water	X	X	X	X
GDEGW00803	27513.05	Water	X	X	X	X
GDEGW01003	27530.01	Water	X	X	X	X
GDEGW08D03	27513.06	Water	X	X	X	X
GDEGW10D03	27530.05	Water	X	X	X	X
GDEDW01003	27530.02	Water	X	X	X	X
GDEEW01003	27530.03	Water	X	X	X	X
GDEFW01003	27530.04	Water	X	X	X	X
GDETW00803	27513.07	Water	X			
GDETW01003	27530.12	Water	X			
GDEGW00703MS	27513.04MS	Water	+			
GDEGW00703MSD	27513.04MSD	Water	+			
GDEGW01003MS	27530.01MS	Water	+			
GDEGW01003MSD	27530.01MSD	Water	+			
145GW01D03S	27530.08D	Water				+
145GW01D03SD	27530.09SD	Water				+

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
145GW00103	27530.06	Water		X	X	X
145GW00203*	27530.10	Water		X	X	X
145GW00303	27513.08	Water		X	X	X
145GW01D03	27530.07	Water		X	X	X
580GW00203*	27530.11	Water		X	X	X
583GW00203	27513.01	Water		X	X	X
583GW00303	27513.03	Water		X	X	X
583GW02D03	27513.02	Water		X	X	X
GDEGW00703	27513.04	Water	X	X	X	X
GDEGW00803	27513.05	Water	X	X	X	X
GDEGW01003	27530.01	Water	X	X	X	X
GDEGW08D03	27513.06	Water	X	X	X	X
GDEGW10D03	27530.05	Water	X	X	X	X
GDEDW01003	27530.02	Water	X	X	X	X
GDEEW01003	27530.03	Water	X	X	X	X
GDEFW01003	27530.04	Water	X	X	X	X
145GW01D03MS	27530.08MS	Water		+	+	
145GW01D03MSD	27530.09MSD	Water		+	+	

* = Samples were associated with field duplicate samples 145HW00203 and 580HW00203 in SDG 27513A.

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK,
FW = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

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

RELEASE SIGNATURE:

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - Appendix IX CLP Inorganics

SAMPLES: 145HW00203, 580HW00203

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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
DW*	antimony	2.30 ug/L	11.5 ug/L
EW*	beryllium	0.78 ug/L	3.90 ug/L
EW*	calcium	27.5 ug/L	138 ug/L
FW *	chromium	2.40 ug/L	12.0 ug/L
PBW	copper	4.08 ug/L	20.4 ug/L
FW*	nickel	7.20 ug/L	36.0 ug/L
PBW	silver	2.94 ug/L	14.7 ug/L
CCB3	thallium	3.00 ug/L	15.0 ug/L
FW*	tin	2.60 ug/L	13.0 ug/L
DW*	vanadium	0.97 ug/L	4.85 ug/L
FW*	cyanide	2.40 ug/L	12.0 ug/L

* = DW, EW and FW were field blanks analyzed in SDG 27513B.

CCB = Continuing Calibration Blank, DW = Deionized Water Blank (GDEDW01003), EW = Equipment Rinsate Blank (GDEEW01003), FW = Field Blank (GDEFW01003), 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 in the continuing calibration blanks (CCB's):

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB4	aluminum	-42.6 ug/L	213 ug/L
CCB1	iron	-42.9 ug/L	215 ug/L
CCB1	nickel	-1.10 ug/L	5.50 ug/L
CCB3	selenium	-3.00 ug/L	15.0 ug/L
CCB6	cyanide	-5.60 ug/L	28.0 ug/L

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	5 ug/L
beryllium	1 ug/L
chromium	1 ug/L
cobalt	1 ug/L
nickel	2 ug/L
selenium	5 ug/L
thallium	4 ug/L

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

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

antimony	-4 ug/L
barium	-1 ug/L
cadmium	-2 ug/L
copper	-6 ug/L
manganese	-1 ug/L
vanadium	-1 ug/L

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

V.) ICP Serial Dilution Analysis:

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 required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 145HW00203 / 145GW00203 (analyzed in SDG 27513B) and 580HW00203 / 580GW00203 (analyzed in SDG 27513B), were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	145HW00203	145GW00203	RPD
calcium	136000 ug/L	141000 ug/L	3.6%
iron	1140 ug/L	1160 ug/L	1.7%
magnesium	13200 ug/L	13600 ug/L	3.0%
manganese	132 ug/L	136 ug/L	3.0%
potassium	14000 ug/L	13500 ug/L	3.6%
sodium	27400 ug/L	28400 ug/L	3.6%

Analyte	580HW00203	580GW00203	RPD
arsenic	14.3 ug/L	15.6 ug/L	8.7%
calcium	14600 ug/L	16000 ug/L	9.2%
iron	10300 ug/L	11400 ug/L	10.1%
magnesium	5290 ug/L	5780 ug/L	9.7%
manganese	118 ug/L	129 ug/L	8.9%
sodium	52400 ug/L	53800 ug/L	2.6%
sodium	27400 ug/L	28400 ug/L	3.6%

None of the RPD's exceeded 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides were detected at 2.0 mg/L in method blank CHLORBLKC. Since the positive results in both SDG samples exceeded 5X this amount, no action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Chlorides were detected at 0.78 mg/L in deionized water blank GDEDW01003 and 0.28 mg/L in equipment rinsate blank GDEEW01003, which were analyzed in SDG 27513B. Since the positive results for chlorides in both SDG samples exceeded 5X these amounts, no action was required. Chlorides were not detected in the field blank, also analyzed in SDG 27513B.

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 Differences (RPD's) for chlorides in field duplicate sample pairs 145HW00203 / 145GW00203 (analyzed in SDG 27513B) and 580HW00203 / 580GW00203 (analyzed in SDG 27513B) were 11.4% and 0.7%, respectively, which were within the 30% QC limit for water samples. No action was necessary.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 detected at 2.0 mg/L in both method blanks SULBLKC and SULBLKD. Since the positive results in both SDG samples exceeded 5X this amount, no action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks analyzed in SDG 27513B. 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 Differences (RPD's) for sulfates in field duplicate sample pairs 145HW00203 / 145GW00203 (analyzed in SDG 27513B) and 580HW00203 / 580GW00203 (analyzed in SDG 27513B) were 2.9% and 0.3%, respectively, which were within the 30% QC limit for water samples. No action was necessary.

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:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field blanks analyzed in SDG 27513B. 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 Differences (RPD's) for TDS in field duplicate sample pairs 145HW00203 / 145GW00203 (analyzed in SDG 27513B) and 580HW00203 / 580GW00203 (analyzed in SDG 27513B) were 0.7% and 1.7%, respectively, which were within the 30% QC limit for water samples. No action was necessary.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27513B CLP Organics and Inorganics

SAMPLES: 145GW00103, 145GW00203, 145GW00303, 145GW01D03, 580GW00203, 583GW00203, 583GW00303, 583GW02D03, GDEGW00703, GDEGW00803, GDEGW01003, GDEGW08D03, GDEGW10D03, GDEDW01003, GDEEW01003, GDEFW01003, GDETW00803, GDETW01003, GDEGW00703MS, GDEGW00703MSD, GDEGW01003MS, GDEGW01003MSD, 145GW01D03S, 145GW01D03SD, 145GW01D03MS, 145GW01D03MSD

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 11/01/96 on instrument R for the following compounds:

chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%

There were no positive detections of these compounds in the SDG samples. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/12/96 at 09:44 on instrument R for the following compounds:

2-chloroethyl vinyl ether	39.9%
vinyl acetate	55.0%

The non-detect results for these two compounds in associated samples GDEGW01003 and GDEGW10D03 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Acetone was detected at 13 ug/L in method blank VBLK2. The field blank was used for blank qualifications. No further action was necessary.

Deionized Water and Equipment Rinsate Blanks:

Acetone was detected at 14 ug/L and 13 ug/L, respectively, in deionized water blank GDEDW01003. and equipment rinsate blank GDEEW01003. The field blank was used for blank qualifications. No further action was necessary.

Field Blank:

Acetone was detected at 30 ug/L in field blank GDEFW01003. All positive detections of acetone in the SDG samples, which were less than 10X the blank amount, were flagged as undetected (U) with the analytical result being replaced with the amount of contamination in each sample.

Trip Blanks:

Acetone was detected at 20 ug/L and 9 ug/L, respectively, in trip blanks GDETW00803 and GDETW01003. The field blank was used for blank qualifications. No further action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Differences (RPD's) for spiked samples GDEGW01003MS and GDEGW01003MSD exceeded their respective QC limits for the following compounds:

Compound	RPD	QC Limit
1,1-dichloroethene	27%	14%
trichloroethene	24%	14%
benzene	19%	11%
toluene	21%	13%
chlorobenzene	21%	13%

The results for these compounds in unspiked sample GDEGW01003, which consisted entirely of non-detects, were flagged as estimated (UJ). All criteria were met for the second set of MS / MSD samples. No further action was required.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

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 analytical results and Q-indicators for 29 compounds were missing from the spreadsheets for sample GDEGW00703. The missing items were transcribed from the Form I's to the spreadsheets by the validator. All 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:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 11/14/96 on instrument T for the following compounds:

2,2'-oxybis(1-chloropropane)	33.8%
benzoic acid	65.3%
naphthalene	43.0%

There were no positive detections of these compounds in the associated samples. No action was necessary.

The Percent Relative Standard Deviation (%RSD) for naphthalene was 35.4% for the standards analyzed on 11/18/96 on instrument T, which exceeded the 30% QC limit. Since 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 11/15/96 at 06:23 on instrument T for the following compounds:

naphthalene	34.6%
2,4-dinitrophenol	40.5%
4,6-dinitro-2-methylphenol	29.7%

The non-detect results for these compound in associated sample GDEGW00803 were flagged as estimated (UJ).

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 for this SDG. No action was required.

TIC's:

Ethyl hexanol was detected at 5 ug/L and 4 ug/L, respectively, in the deionized water and field blanks. There were no positive detections of this compound in the associated samples. No action was necessary.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of surrogate compound 2-fluorobiphenyl was 38% in sample GDEGW10D03, which was below the 43-116% QC limits. Since only one surrogate was outside QC limits in the base/neutral fraction, no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. Several Percent Recoveries were outside QC limits. Data validation based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG, so no action was required.

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.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Difference (%D) for endrin was 28.0% for the PEM14C standard analyzed on 11/18/96 at 16:01 on the secondary column, which exceeded the 25% QC limit. The non-detect result for endrin in associated sample GDEGW10D03 was flagged as estimated (UJ).

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 11/18/96 at 19:33 on the secondary column for the following compounds:

endosulfan I	26.5%
beta-BHC	27.5%
alpha-chlordane	25.9%

The non-detect results for these compounds in associated sample GDEGW10D03 were flagged as estimated (UJ).

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. 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 by the laboratory. Several Percent Recoveries were below 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):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

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:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC sample cleanup 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:

All Initial and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
DW	antimony	2.30 ug/L	11.5 ug/L
EW	beryllium	0.78 ug/L	3.90 ug/L
EW	calcium	27.5 ug/L	138 ug/L
FW	chromium	2.40 ug/L	12.0 ug/L
PBW	copper	4.08 ug/L	20.4 ug/L
FW	nickel	7.20 ug/L	36.0 ug/L
PBW	silver	2.94 ug/L	14.7 ug/L
CCB3	thallium	3.00 ug/L	15.0 ug/L
FW	tin	2.60 ug/L	13.0 ug/L
DW	vanadium	0.97 ug/L	4.85 ug/L
FW	cyanide	2.40 ug/L	12.0 ug/L

CCB = Continuing Calibration Blank, DW = Deionized Water Blank (GDEDW01003), EW = Equipment Rinsate Blank (GDEEW01003), FW = Field Blank (GDEFW01003), 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 in the continuing calibration blanks (CCB's):

Blank ID	Analyte	Neg. Conc.	5X Conc.
CCB4	aluminum	-42.6 ug/L	213 ug/L
CCB1	iron	-42.9 ug/L	215 ug/L
CCB1	nickel	-1.10 ug/L	5.50 ug/L
CCB3	selenium	-3.00 ug/L	15.0 ug/L
CCB6	cyanide	-5.60 ug/L	28.0 ug/L

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	5 ug/L
beryllium	1 ug/L
chromium	1 ug/L
cobalt	1 ug/L
nickel	2 ug/L
selenium	5 ug/L
thallium	4 ug/L

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

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

antimony	-4 ug/L
barium	-1 ug/L
cadmium	-2 ug/L
copper	-6 ug/L
manganese	-1 ug/L
vanadium	-1 ug/L

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

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (S / SD):

All Matrix Spike/Matrix Spike Duplicate criteria were met. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 145GW00203 / 145HW00203 (analyzed in SDG 27441A) and 580GW00203 / 580HW00203 (analyzed in SDG 27513A), were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	145HW00203	145GW00203	RPD
calcium	136000 ug/L	141000 ug/L	3.6%
iron	1140 ug/L	1160 ug/L	1.7%
magnesium	13200 ug/L	13600 ug/L	3.0%
manganese	132 ug/L	136 ug/L	3.0%
potassium	14000 ug/L	13500 ug/L	3.6%
sodium	27400 ug/L	28400 ug/L	3.6%

Analyte	580HW00203	580GW00203	RPD
arsenic	14.3 ug/L	15.6 ug/L	8.7%
calcium	14600 ug/L	16000 ug/L	9.2%
iron	10300 ug/L	11400 ug/L	10.1%
magnesium	5290 ug/L	5780 ug/L	9.7%
manganese	118 ug/L	129 ug/L	8.9%
sodium	52400 ug/L	53800 ug/L	2.6%
sodium	27400 ug/L	28400 ug/L	3.6%

None of the RPD's exceeded 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides were detected at 2.0 mg/L in method blanks CHLORBLKA, CHLORBLKB and CHLORBLKD. Since the positive results in all SDG samples exceeded 5X this amount, no action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Chlorides were not detected in the field blank. Chlorides were detected at 0.78 mg/L in deionized water blank GDEDW01003 and 0.28 mg/L in equipment rinsate blank GDEEW01003. The positive results for chlorides in both SDG samples exceeded 5X these amounts. 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 Differences (RPD's) for chlorides in field duplicate sample pairs 145GW00203 / 145HW00203 (analyzed in SDG 27513A) and 580GW00203 / 580HW00203 (analyzed in SDG 27513A) were 11.4% and 0.7%, respectively. No action was necessary since both RPD's were within

the 30% QC limit for water samples.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 detected at 2.0 mg/L each in method blanks SULBLKA, SULBLKC and SULBLKD. The positive results in associated samples 583GW00303, GDEGW00803, GDEGW01003 and GDEGW08D03, which were less than 5X the blank amounts were flagged undetected (U) with the detection limit being raised to the amount of contamination in each sample. The positive results in the other SDG samples exceeded 5X the blank amounts, so no further action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks analyzed 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):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Differences (RPD's) for sulfates in field duplicate sample pairs 145GW00203 / 145HW00203 (analyzed in SDG 27513A) and 580GW00203 / 580HW00203 (analyzed in SDG 27513A) were 2.9% and 0.3%, respectively, which were within the 30% QC limit for water samples. No action was necessary.

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:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field blanks analyzed 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):

MS / MSD Analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Differences (RPD's) for TDS in field duplicate sample pairs 145GW00203 / 145HW00203 (analyzed in SDG 27513A) and 580GW00203 / 580HW00203 (analyzed in SDG 27513A) were 0.7% and 1.7%, respectively, which were within the 30% QC limit for water samples. No action was necessary.

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:	0164
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVEL:	EPA Level III
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBER:	27551 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
566GW00103	27551.03	Water				X
566GW01D03	27551.04	Water				X
574GW00103	27600.01	Water				X
574GW00203	27618.02	Water				X
574GW00303	27618.03	Water				X
574GW01D03	27618.01	Water				X
576GW00103	27600.02	Water	X	X		X
576GW00203	27600.05	Water	X	X		X
576GW02D03	27600.06	Water	X	X		X
580GW00103	27551.01	Water				X
580GW01D03	27551.02	Water				X
GDEGW01103	27551.06	Water	X	X	X	X
GDEGW01203	27618.04	Water	X	X	X	X
GDEGW01303	27600.08	Water	X	X	X	X
GDEGW01503	27618.08	Water	X	X	X	X
GDEGW11D03	27551.05	Water	X	X	X	X
GDEGW12D03	27618.05	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEGW13D03	27600.07	Water	X	+	X	X
GDEGW13D03RE	27600.07RE	Water		X		
GDETW01103	27551.07	Water	X			
GDETW01303	27600.09	Water	X			
GDETW01503	27618.09	Water	X			
576GW00103MS	27600.03MS	Water	+	+		+
576GW00103MSD	27600.04MSD	Water	+	+		+
GDEGW11D03MS	27551.05MS	Water	+			
GDEGW11D03MSD	27551.05MSD	Water	+			
GDEGW12D03MS	27618.06MS	Water	+	+	+	+
GDEGW12D03MSD	27618.06MSD	Water	+	+	+	+

Sample #	Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
566GW00103	27551.03	Water		X	X	X
566GW01D03	27551.04	Water		X	X	X
574GW00103	27600.01	Water		X	X	X
574GW00203	27618.02	Water		X	X	X
574GW00303	27618.03	Water		X	X	X
574GW01D03	27618.01	Water		X	X	X
576GW00103	27600.02	Water		X	X	X
580GW00103	27551.01	Water		X	X	X
580GW01D03	27551.02	Water		X	X	X
GDEGW01103	27551.06	Water	X	X	X	X
GDEGW01203	27618.04	Water	X	X	X	X
GDEGW01303	27600.08	Water	X	X	X	X
GDEGW01503	27618.08	Water	X	X	X	X
GDEGW11D03	27551.05	Water	X	X	X	X
GDEGW12D03	27618.05	Water	X	X	X	X
GDEGW13D03	27600.07	Water	X	X	X	X
576GW00103MS	27600.03MS	Water		+	+	
576GW00103MSD	27600.04MSD	Water		+	+	
GDEGW12D03MS	27618.06MS	Water	+	+	+	
GDEGW12D03MSD	27618.07MSD	Water	+	+	+	

+ = Non-billable analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS,
T = TRIP BLANK

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

RELEASE SIGNATURE:

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - SDG 27551 Organics and Inorganics

SAMPLES: 566GW00103, 566GW01D03, 574GW00103, 574GW00203, 574GW00303, 574GW01D03, 576GW00103, 576GW00203, 576GW02D03, 580GW00103, 580GW01D03, GDEGW01103, GDEGW01203, GDEGW01303, GDEGW01503, GDEGW11D03, GDEGW12D03, GDEGW13D03, GDEGW13D03RE, GDETW01103, GDETW01303, GDETW01503, 576GW00103MS, 576GW00103MSD, GDEFW11D03MS, GDEGW11D03MSD, GDEGW12D03MS, GDEGW12D03MSD

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) for acetone was 39.1% for the standards analyzed on 10/11/96 on instrument K, which exceeded the 30% QC limit. The positive results for acetone in the associated samples were flagged as estimated (J). The associated samples were 576GW00103, 576GW00203, 576GW02D03, GDEGW01203, GDEGW01303, GDEGW01503 and GDEGW12D03.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.020 for the standard analyzed on 11/12/96 at 07:30 on instrument K, which was below the 0.050 QC limit. The non-detect results for this compound in associated samples GDEGW01103, GDEGW11D03 and trip blank GDETW01103 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/12/96 at 07:30 on instrument K for the following compounds:

2-chloroethyl vinyl ether	71.4%
vinyl acetate	29.6%
4-methyl-2-pentanone	28.3%
2-hexanone	34.0%

The non-detect results for 2-chloroethyl vinyl ether were previously rejected because of a low RRF in this calibration. The non-detect results for the other three compounds in associated samples GDEGW01103 and GDEGW11D03 were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.024 for the standard analyzed on 11/15/96 at 07:55 on instrument K, which was below the 0.050 QC limit. The non-detect results for this compound in the associated samples were rejected (R). The associated samples were 576GW00103, 576GW00203, 576GW02D03, GDEGW01203, GDEGW01303, GDEGW01503, GDEGW12D03 and GDEGW13D03 and trip blanks GDETW01303 and GDETW01503.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/15/96 at 07:55 on instrument K for the following compounds:

2-chloroethyl vinyl ether	65.9%
vinyl acetate	30.9%

The non-detect results for 2-chloroethyl vinyl ether were previously rejected because of a low RRF in this calibration. The non-detect results for vinyl acetate in the associated samples were flagged as estimated (UJ). The associated samples were 576GW00103, 576GW00203, 576GW02D03, GDEGW01203, GDEGW01303, GDEGW01503, GDEGW12D03 and GDEGW13D03.

IV.) Blanks:

Method Blanks:

Acetone was detected at 8 ug/L in method blank VBLK1. The positive detection of acetone in associated sample GDEGW01103, 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.

Trip Blanks:

Acetone was detected at 5 ug/L in trip blank GDETW01103. Method blank VBLK1 was previously used for blank qualification of associated sample GDEGW01103. No further action was necessary.

Methylene chloride was detected at 2 ug/L in trip blank GDETW01303. The positive detections of this compound 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 576GW00103, 576GW00203, 576GW02D03 and GDEGW13D03.

Methylene chloride and chloromethane were both detected at 2 ug/L in trip blank GDETW01503. The positive detections of methylene chloride in associated samples GDEGW01203, GDEGW01503 and GDEGW12D03, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL. Chloromethane was not detected in the associated samples. No further action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed for this SDG. One Percent Recovery (%R) was below QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG. No action was required.

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 all ten samples and three trip blanks comprising this SDG because of low RRF's in the 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:

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/3/96 on instrument J for the following compounds:

naphthalene	35.9%
acenaphthylene	31.0%
di-n-butylphthalate	37.5%

These compounds were not detected in the associated samples. No action was necessary.

The Percent Relative Standard Deviation (%RSD) for benzo(g,h,i)perylene was 33.6% for the standards analyzed on 12/10/96 on instrument F, which exceeded the 30% QC limit. There were no positive results for this compound 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 12/3/96 at 11:45 on instrument J for the following compounds:

benzoic acid	28.2%
acenaphthene	27.2%

The non-detect results for these compound in associated samples GDEGW01203, GDEGW01503 and GDEGW12D03 were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/6/96 at 16:26 on instrument S for the following compounds:

benzoic acid	31.0%
2,4-dinitrophenol	43.3%
2-methyl-4,6-dinitrophenol	28.8%

The non-detect results for these compounds in associated sample GDEGW13D03RE were flagged as estimated (UJ).

IV.) Blanks:

Bis(2-ethylhexyl)phthalate was detected in method blank SBLK4. The positive detections of this compound in associated samples GDEGW01203 and GDEGW12D03, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL.

TIC's:

Several TIC's were detected in method blanks SBLK1 and SBLK4. There were no positive detections of these TIC's in the associated samples. No action was required.

V.) Surrogate Recoveries:

The Percent Recoveries (%R's) of surrogate compounds phenol-d5 (3%), 2-fluorobiphenyl (3%) and 2,4,6-tribromophenol (9%) were below the 10% QC rejection limit in sample GDEGW13D03. All Surrogate and Holding Time criteria were met for reanalysis sample GDEGW13D03RE. The reanalysis was chosen for validation. No further action was necessary.

The Percent Recoveries (%R's) were below their respective QC limits in sample 576GW00103 for the following surrogates:

Surrogate	%R	QC Limits
phenol-d5	1	10-94%
2-fluorophenol	0	21-100%
2,4,6-tribromophenol	0	10-123%

This sample was not reanalyzed. Since the %R's were below the 10% QC rejection limit, all acid fraction compounds, which consisted entirely of non-detects, were rejected (R).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) for spiked sample 576GW00103MS and 576GW00103MSD were below their respective QC limits for the following compounds:

Compound	MS, %R	MSD, %R	QC Limits
phenol	0	2	12-110%
2-chlorophenol	0	2	27-123%
4-chloro-3-methylphenol	2	4	23-97%
pentachlorophenol	6	7	9-103%

Since all acid compounds were previously rejected in unspiked sample 576GW00103 because of low surrogate recoveries, no further action was required.

The Percent Recoveries (%R's) of 4-nitrophenol were 90% and 95%, respectively, in spiked samples GDEGW12D03MS and GDEGW12D03MSD, which exceeded the 10-80% QC limits. Since this compound was not detected in unspiked sample GDEGW12D03, no action was taken.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. Several Percent Recoveries were outside QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this SDG, so no action was required.

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 reanalysis of sample GDEGW13D03 was considered by the validator to be of preferable data quality compared to the original analysis because of improved surrogate recoveries.

All acid compounds in sample 576GW00103, which consisted entirely of non-detects, were rejected because of 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, so no action was required.

II.) Instrument Performance:

The Percent Difference (%D) was 32.4% for endrin in the PEM14B standard analyzed on 11/15/96 at 22:23 on the secondary column, which exceeded the 25% QC limit. The non-detect result for endrin in associated samples GDEGW01103 and GDEGW11D03 were flagged as estimated (UJ).

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 taken.

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 required.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed by the laboratory. Several Percent Recoveries were below 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):

All MS / MSD criteria were met. No action was required.

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 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 sample cleanup 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:

All Continuing Calibration criteria were met. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
ICB	antimony	5.20 ug/L	26.0 ug/L
CCB2	beryllium	0.60 ug/L	3.00 ug/L
PBW	calcium	31.4 ug/L	157 ug/L
ICB	copper	11.0 ug/L	55.0 ug/L
PBW	silver	1.49 ug/L	7.45 ug/L
PBW	thallium	2.71 ug/L	13.6 ug/L
ICB	vanadium	0.60 ug/L	3.00 ug/L
PBW	cyanide	2.03 ug/L	10.2 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 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB2	aluminum	-23.8 ug/L	119 ug/L
ICB	chromium	-1.30 ug/L	6.50 ug/L
PBW	copper	-4.41 ug/L	22.1 ug/L
CCB1	nickel	-1.10 ug/L	5.50 ug/L
ICB	thallium	-3.30 ug/L	16.5 ug/L
CCB1	tin	-3.70 ug/L	18.5 ug/L
CCB3	cyanide	-5.60 ug/L	28.0 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 positive concentrations greater than the IDL:

arsenic	5 ug/L
beryllium	1 ug/L
chromium	1 ug/L
copper	11 ug/L
lead	2 ug/L
nickel	3 ug/L
selenium	6 ug/L
thallium	4 ug/L

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

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

antimony	-4 ug/L
barium	-1 ug/L
cadmium	-5 ug/L
vanadium	-1 ug/L

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

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) of potassium was 128% for spiked sample 576GW00103MS, which exceeded the 75-125% QC limits. All positive results for potassium in the SDG samples were flagged as estimated (J).

The Percent Recovery (%R) of thallium was 72.2% for spiked sample GDEGW12D03MS, which was below the 75-125% QC limits. All positive and non-detect results for thallium in the SDG samples were flagged as estimated (J).

IX.) Field Duplicates:

There were no field duplicate samples 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. No action was required.

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.

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:

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 criteria were met. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 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 criteria were met. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

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:

TDS 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.) 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:

Field duplicate samples were not analyzed in this SDG. No action was taken.

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:	0172
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVEL:	EPA Level III / Level IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Organotin, Total Metals, Cyanide, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27639 (Level IV) 27639 (Level III)

SAMPLES:

SDG 27639A (Level IV):

Client Sample #	Lab Sample #	Matrix	Total Metals	Chlorides	Sulfates	TDS
084HW00203	27653.01	Water	X	X	X	X

* Corresponding duplicate sample 084GW00203 was analyzed in SDG 27639B.

HW = FIELD DUPLICATE

SDG 27639B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Organo-tin
172GW00103	27639.03	Water	X	X		
172GW00203	27652.01	Water	X	X		X
172GW00203RE	27652.01RE	Water		+		
172GW02D03	27639.04	Water	X	X		

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Organo-tin
GDEGW01403	27652.07	Water	X	X	X	
GDEGW01403RE	27652.07RE	Water		+		
GDEGW01803	27652.08	Water	X	X	X	
GDEGW01803RE	27652.08RE	Water		+		
GDEGW14D03	27639.05	Water	X	X	X	
GDEGW15D03	27639.06	Water	X	X	X	
GDEGW18D03	27652.09	Water	X	X	X	
GDEGW18D03RE	27652.09RE	Water		+		
084DW00103	27652.02	Water	X	X	X	+
084DW00103RE	27652.02RE	Water		+		X
084EW00103	27652.03	Water	X	X	X	+
084EW00103RE	27652.03RE	Water		+		X
084FW00103	27652.04	Water	X	X	X	+
084FW00103RE	27652.04RE	Water		+		X
GDETW15D03	27639.07	Water	X			
GDETW18D03	27652.10	Water	X			

Client Sample #	Lab Sample #	Matrix	Total Metals	Cyanide	Chlorides	Sulfates	TDS
083GW00103	27639.01	Water	X		X	X	X
083GW00203	27639.02	Water	X		X	X	X
084GW00103	27652.05	Water	X		X	X	X
084GW00203*	27652.06	Water	X		X	X	X
172GW00103	27639.03	Water	X		X	X	X
172GW00203	27652.01	Water	X		X	X	X
172GW02D03	27639.04	Water	X		X	X	X
GDEGW01403	27652.07	Water	X	X	X	X	X
GDEGW01803	27652.08	Water	X	X	X	X	X
GDEGW14D03	27639.05	Water	X	X	X	X	X
GDEGW15D03	27639.06	Water	X	X	X	X	X
GDEGW18D03	27652.09	Water	X	X	X	X	X
084DW00103	27652.02	Water	X	X	X	X	X
084EW00103	27652.03	Water	X	X	X	X	X
084FW00103	27652.04	Water	X	X	X	X	X

+ = Non-billable analysis
* = Corresponding duplicate sample 084HW00203 was analyzed in SDG 27639A.

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, RE = REEXTRACTION / REANALYSIS, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

J	-	The associated numerical value is an estimated quantity.
JB	-	The associated numerical value is an estimated quantity, possibly biased high or false positive based upon blank data or professional judgement.
JH	-	The associated numerical value is an estimated quantity, possibly biased high.
JL	-	The associated numerical value is an estimated quantity, possibly biased low.
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 Laboratories of Oklahoma, Inc. - 27639A Appendix IX CLP Inorganics

SAMPLE: 084HW00203

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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB4	antimony	2.80 ug/L	14.0 ug/L
EW	calcium	41.2 ug/L	206 ug/L
EW	chromium	0.88 ug/L	4.40 ug/L
PBW	copper	3.24 ug/L	16.2 ug/L
CCB2	lead	1.90 ug/L	9.60 ug/L
DW	mercury	4.80 ug/L	24.0 ug/L
PBW	nickel	1.28 ug/L	6.40 ug/L
CCB1	selenium	3.10 ug/L	15.5 ug/L
EW	zinc	6.90 ug/L	34.5 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water),
DW = Deionized, Water Blank 084DW00103 (Analyzed in SDG 27639B),
EW = Equipment Rinsate Blank 084EW00103 (Analyzed in SDG 27639B)

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 or equipment rinsate 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	arsenic	-2.60 ug/L	13.0 ug/L
CCB3	silver	-1.40 ug/L	7.00 ug/L
CCB4	thallium	-4.10 ug/L	20.5 ug/L

CCB = Continuing Calibration Blank

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	4 ug/L
chromium	1 ug/L
copper	1 ug/L
nickel	4 ug/L
selenium	6 ug/L
thallium	4 ug/L

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

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

antimony	-6 ug/L
barium	-1 ug/L
lead	-2 ug/L
silver	-2 ug/L
thallium	-4 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples 084HW00203 and 084GW00203 (analyzed in SDG 27639B) were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	084HW00203, ug/L	084GW00203, ug/L	RPD
arsenic	43.4	46.3	6.5%
calcium	22500	22800	1.3%
iron	1920	2040	6.1%
magnesium	5390	5410	0.4%
manganese	271	272	0.4%
sodium	43900	44100	0.5%

None of the RPD's exceeded 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides were not detected in the method blank. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

Chlorides were not detected in the two field blanks, which were analyzed in SDG 27639B. No action was required.

Field Blank:

Chlorides were detected at 2.0 mg/L in field blank 084FW00103, which was analyzed in SDG 27639B. The detection of chlorides in sample 084HW00203 was greater than 5X the blank amount. 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

Sample 084HW00203 was analyzed in this SDG while corresponding sample 084GW00203 was analyzed in SDG 27639B. The Relative Percent Difference (RPD) for chlorides was 5.1%, which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 Blank:

Sulfates were not detected in the method blank. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 27639B. 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

Sample 084HW00203 was analyzed in this SDG while corresponding sample 084GW00203 was analyzed in SDG 27639B. The Relative Percent Difference (RPD) for sulfates was 3.0%, which was within the 30% QC limit for water samples. No action was taken.

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 Blank:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water Blank:

TDS was not detected in the deionized water blank, which was analyzed in SDG 27639B. No action was required.

Equipment Rinsate Blank:

TDS was detected at 40 mg/L in equipment rinsate blank 084EW00103, which was analyzed in SDG 27639B. The field blank was used for blank qualification. No further action was taken.

Field Blank:

TDS was detected at 44 mg/L in field blank 084FW00103, which was analyzed in SDG 27639B. The detection of TDS in sample 084HW00103, which was less than 5X the blank amount, was flagged as undetected (U) with the detection limit being raised to the amount of contamination in the 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 SDG. No action was required.

VI.) Field Duplicates:

Sample 084HW00203 was analyzed in this SDG while corresponding sample 084GW00203 was analyzed in SDG 27639B. The Relative Percent Difference (RPD) for TDS in the two samples was not calculable. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27639B CLP Organics and Inorganics

SAMPLES: 083GW00103, 083GW00203, 084GW00103, 084GW00203, 172GW00103, 172GW00203, 172GW00203RE, 172GW02D03, GDEGW01403, GDEGW01403RE, GDEGW01803, GDEGW01803RE, GDEGW14D03, GDEGW15D03, GDEGW18D03, GDEGW18D03RE, 084DW00103, 084DW00103RE, 084EW00103, 084EW00103RE, 084FW00103, 084FW00103RE, GDETW15D03, GDETW18D03

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) for acetone was 39.3% for the standards analyzed on 10/11/96 on instrument K, which exceeded the 30% QC limit. There were no positive results for acetone in the associated samples after blank qualifications. No action was necessary.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.024 for the standard analyzed on 11/19/96 at 09:23 on instrument K, which was below the 0.050 QC limit. The non-detect results for this compound in the associated samples were rejected (R). The associated samples were 172GW00103, 172GW02D03, GDEGW14D03, GDEGW15D03 and trip blank GDETW15D03.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/19/96 at 09:23 on instrument K for the following compounds:

2-chloroethyl vinyl ether	65.7%
vinyl acetate	26.4%

The non-detect results for 2-chloroethyl vinyl ether were previously rejected because of a low RRF in this calibration. The non-detect results for vinyl acetate in the associated samples were flagged as

estimated (UJ). The associated samples were 172GW00103, 172GW02D03, GDEGW14D03 and GDEGW15D03.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.021 for the standard analyzed on 11/21/96 at 11:13 on instrument K, which was below the 0.050 QC limit. The non-detect results for this compound in the associated samples were rejected (R). The associated samples were 172GW00203, GDEGW01403, GDEGW01803, GDEGW18D03, deionized water blank 084DW00103, equipment rinsate blank 084EW00103 and field blank 084FW00103.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/21/96 at 11:13 on instrument K for the following compounds:

2-chloroethyl vinyl ether	70.0%
vinyl acetate	30.3%

The non-detect results for 2-chloroethyl vinyl ether were previously rejected because of a low RRF in this calibration. The non-detect results for vinyl acetate in the associated samples were flagged as estimated (UJ). The associated samples were 172GW00203, GDEGW01403, GDEGW01803 and GDEGW18D03.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.018 for the standard analyzed on 11/22/96 at 09:39 on instrument K, which was below the 0.050 QC limit. The non-detect result for this compound in trip blank 084TW18D03 were rejected (R).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water Blank:

Acetone (12 ug/L), carbon disulfide (1 ug/L) and chloroform (2 ug/L) were detected in deionized water blank 084DW00103. Acetone was qualified based on the equipment rinsate blank. Carbon disulfide and chloroform were not detected in the associated samples. No further action was required.

Equipment Rinsate Blank:

Acetone (33 ug/L), methylene chloride (2 ug/L) and chloroform (2 ug/L) were detected in equipment rinsate blank 084EW00103. The detections of acetone and methylene chloride in the SDG samples, which were less than 10X the blank amounts, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL. Chloroform was not detected in the SDG samples. No further action was necessary.

Field Blank:

Acetone (11 ug/L), methylene chloride (2 ug/L) and chloroform (2 ug/L) were detected in field blank 084FW00103. These compounds were previously qualified based on the equipment rinsate blank. No

further action was taken.

Trip Blanks:

Acetone (6 ug/L) and methylene chloride (2 ug/L) were detected in trip blank GDETW15D03. These two compounds were previously qualified using the equipment rinsate blank. There were no detections in trip blank GDEGW18D03. No further action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

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 results for 2-chloroethyl vinyl ether, which consisted entirely of non-detects, were rejected in the eight samples and five field blanks because of low RRF's in the continuing calibrations. All other

laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

The holding times from sample date to reextraction date were 20 days for reextracted samples 172GW00203RE, GDEGW01403RE, GDEGW01803RE, GDEGW18DO3RE and field blanks 084DW00103RE, 084EW00103RE and 084FW00103RE, which exceeded by more than 2X the 7 day QC limit for water samples. All results for these samples, which consisted entirely of non-detects, were rejected and further validation was not performed.

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 12/4/96 on instrument T for the following compounds:

4-methylphenol	31.2%
hexachloroethane	32.0%
hexachlorocyclopentadiene	31.1%

These compounds were not detected in the associated samples. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) for benzo(b)fluoranthene was 27.3%, which exceeded the 25% QC limit for the standard analyzed on 12/10/96 at 07:40 on instrument T. Since the associated samples were reextractions previously rejected because of holding time exceedances, no further action was necessary.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water Blank:

Bis(2-ethylhexyl)phthalate was detected at 4 ug/L in deionized water blank 084DW00103. The detection of this compound in sample GDEGW18D03, 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.

V.) Surrogate Recoveries:

The Percent Recovery (%R) was 12% for surrogate compound 2-fluorophenol in sample 172GW02D03, which was below the 21-100% QC limits. Since only one surrogate was outside QC limits in the acid fraction, no action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. Twelve Percent Recoveries were outside the QC limits. Seven samples were reextracted outside holding time limit and were reanalyzed as a result of the LCS deficiencies. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

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 original analyses of samples 172GW00203RE, GDEGW01403RE, GDEGW01803RE, GDEGW18DO3RE and blanks 084DW00103RE, 084EW00103RE and 084FW00103RE were considered by the validator to be of preferable quality compared to the reextraction analyses because of better holding times. All sample data for the reextractions were rejected because of excessive holding times. All other laboratory data were acceptable with one qualification.

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:

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. No 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 by the laboratory. All Recovery 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 required.

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:

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 qualification.

ORGANOTIN

I.) Holding Times:

The holding time from sample date to reextraction date was 24 days for field blanks 084DW00103RE, 084EW00103RE and 084FW00103RE, which exceeded the 14 day QC limit. Since these samples were field blanks, no action was required.

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 for the standard analyzed on 12/12/96, which was below the 0.050 QC limit. Since all data in associated sample 172GW00203, which consisted entirely of non-detects, were rejected because of an excessively low (0%) surrogate recovery, no further action was necessary.

The average Relative Response Factor (RRF) for tetrabutyltin (TTBT) was 0.034 for the standards analyzed on 12/12/96, which was below the 0.050 QC limit. All results for TTBT in associated blanks 084DW00103RE, 084EW00103RE and 084FW00103RE, which consisted entirely of non-detects, were rejected (R).

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 necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks. No action was required.

V.) Surrogate Recoveries:

Blanks 084DW00103, 084EW00103 and 084FW00103 were reanalyzed due to low surrogate recoveries. All criteria were met for the reanalyses.

The Percent Recovery (%R) of surrogate compound tripropyltin (TPT) was 0% in sample 172GW00203, which was below the 10-160% QC limits. Since the %R was less than 10%, all results for this sample, which consisted entirely of non-detects, were rejected (R). Because of insufficient sample quantity, this sample could not be reextracted and reanalyzed. No further action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD sample were not analyzed in this SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG, so no action was required.

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.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The reextraction analyses of field blanks 084DW00103, 084EW00103 and 084FW00103 were considered by the validator to be of preferable data quality as compared to the original analyses because of improved Surrogate Recoveries.

All results for sample 172GW00203, which consisted entirely of non-detects, were rejected because of a 0% Surrogate Recovery. In addition, the non-detect results for tetrabutyltin (TTBT) in sample 172GW00103 and field blanks 084DW00103RE, 084EW00103RE and 084FW00103RE were rejected because of a low RRF in the continuing calibrations. All other 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:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB4	antimony	2.80 ug/L	14.0 ug/L
EW	calcium	41.2 ug/L	206 ug/L
EW	chromium	0.88 ug/L	4.40 ug/L
PBW	copper	3.24 ug/L	16.2 ug/L
CCB2	lead	1.90 ug/L	9.60 ug/L
DW	mercury	4.80 ug/L	24.0 ug/L
PBW	nickel	1.28 ug/L	6.40 ug/L
CCB1	selenium	3.10 ug/L	15.5 ug/L
EW	zinc	6.90 ug/L	34.5 ug/L
DW	cyanide	4.50 ug/L	22.5 ug/L

CCB = Continuing Calibration Blank, DW = Deionized Water Blank 084DW00103, EW = Equipment Rinsate Blank 084EW00103, 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 or equipment rinsate 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	arsenic	-2.60 ug/L	13.0 ug/L
CCB3	silver	-1.40 ug/L	7.00 ug/L
CCB4	thallium	-4.10 ug/L	20.5 ug/L

CCB = Continuing Calibration Blank

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	4 ug/L
chromium	1 ug/L
copper	1 ug/L
nickel	4 ug/L
selenium	6 ug/L
thallium	4 ug/L

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

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

antimony	-6 ug/L
barium	-1 ug/L
lead	-2 ug/L
silver	-2 ug/L
thallium	-4 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

ICP Serial Dilution Analysis was not performed in this fraction of the 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 required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples 084GW00203 and 084HW00203 (analyzed in SDG 27639A) were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	084HW00203, ug/L	084GW00203, ug/L	RPD
arsenic	43.4	46.3	6.5%
calcium	22500	22800	1.3%
iron	1920	2040	6.1%
magnesium	5390	5410	0.4%
manganese	271	272	0.4%
sodium	43900	44100	0.5%

None of the RPD's exceeded 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 required.

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.

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.

Deionized Water and Equipment Rinsate Blanks:

Chlorides were not detected in the two field blanks. No action was required.

Field Blank:

Chlorides were detected at 2.0 mg/L in field blank 084FW00103. The detections of chlorides in the associated samples less than 5X the blank amounts were flagged as undetected (U), with the detection limit being raised to the amount of contamination in each sample. The associated samples were 083GW00103, 084GW00103 and GDEGW01803.

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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

Sample 084GW00203 was analyzed in this SDG while duplicate sample 084HW00203 was analyzed in SDG 27639A. The Relative Percent Difference (RPD) for chlorides was 5.1%, which was within the 30% QC limit for water samples. No action was taken.

VII.) 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. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were 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.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

Sample 084GW00203 was analyzed in this SDG while duplicate sample 084HW00203 was analyzed in SDG 27639A. The Relative Percent Difference (RPD) for sulfates was 3.0%, which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water Blank:

TDS was not detected in the deionized water blank. No action was required.

Equipment Rinsate Blank:

TDS was detected at 40 mg/L in equipment rinsate blank 084EW00103. The field blank was used for blank qualification. No further action was taken.

Field Blank:

TDS was detected at 44 mg/L in field blank 084FW00103. The detections of TDS in the associated samples, which were less than 5X the blank amount, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample. The associated samples were 083GW00103, 084GW00103, 084GW00203, 172GW00103 and GDEGW01803.

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:

Sample 084GW00203 was analyzed in this SDG while duplicate sample 084HW00203 was analyzed in SDG 27639A. The Relative Percent Difference (RPD) for TDS in the two samples was not calculable. No action was taken.

VII.) 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:	0173
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Levels III and IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27678A (Level IV) 27678B (Level III)

SAMPLES:

SDG 27678A:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEHW19D03*	27700.04	Water	X	X	X	X
GDEDW16D03	27700.01	Water	X	X	X	X
GDEEW16D03	27700.02	Water	X	X	X	X
GDEFW16D03	27700.03	Water	X	X	X	X
573HW00103*	27679.01	Water				X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEHW19D03*	27700.04	Water	X	X	X	X
GDEDW16D03	27700.01	Water	X	X	X	X
GDEEW16D03	27700.02	Water	X	X	X	X
GDEFW16D03	27700.03	Water	X	X	X	X
573HW00103*	27679.01	Water		X	X	X

* = Corresponding samples GDEGW19D03 and 573GW00103 were analyzed in SDG 27678B.
DW = DEIONIZED RINSATE BLANK, EW = EQUIPMENT RINSATE BLANK,
FW = FIELD RINSATE BLANK, H = FIELD DUPLICATE

SDG 27678B:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
570GW00203	27699.01	Water	X			X
570GW02D03	27699.02	Water	X			X
570GW03D03	27699.03	Water	X			X
572GW00103	27678.03	Water	X			X
572GW00203	27678.04	Water	X			X
572GW00303	27678.05	Water	X			X
573GW00103*	27678.01	Water				X
573GW01D03	27678.02	Water				X
GDEGW01603	27678.10	Water	X	X	X	X
GDEGW01703	27678.06	Water	X	X	X	X
GDEGW01903	27699.05	Water	X	X	X	X
GDEGW16D03	27699.04	Water	X	X	X	X
GDEGW17D03	27678.09	Water	X	X	X	X
GDEGW19D03	27699.06	Water	X	X	X	X
GDETW01703	27678.11	Water	X			
GDETW19D03	27699.07	Water	X			
GDEGW01703MS	27678.06MS	Water	+	+	+	
GDEGW01703MSD	27678.06MSD	Water	+	+	+	
GDEGW19D03MS	27699.06MS	Water			+	
GDEGW19D03MSD	27699.06MSD	Water			+	

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
570GW00203	27699.01	Water		X	X	X
570GW02D03	27699.02	Water		X	X	X
570GW03D03	27699.03	Water		X	X	X
572GW00103	27678.03	Water		X	X	X
572GW00203	27678.04	Water		X	X	X
572GW00303	27678.05	Water		X	X	X
573GW00103	27678.01	Water		X	X	X
573GW01D03	27678.02	Water		X	X	X
GDEGW01603	27678.10	Water	X	X	X	X
GDEGW01703	27678.06	Water	X	X	X	X
GDEGW01903	27699.05	Water	X	X	X	X
GDEGW16D03	27699.04	Water	X	X	X	X
GDEGW17D03	27678.09	Water	X	X	X	X
GDEGW19D03	27699.06	Water	X	X	X	X
GDEGW01703MS	27678.06MS	Water		+	+	
GDEGW01703MSD	27678.06MSD	Water		+	+	

* = Duplicate samples GDEHW19D03 and 573HW00103 were analyzed in SDG 27678A.
MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27678A Appendix IX Organics & Inorganics

SAMPLES: GDEDW16D03, GDEEW16D03, GDEFW16D03, GDEHW019D03, 573HW00103

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 10/11/96 on instrument R for the following compounds:

acrolein	0.026
isobutyl alcohol	0.005
1,4-dioxane	0.002

The results for these compounds in associated blanks GDEDW16D03, GDEEW16D03, and GDEFW16D03 and sample GDEHW019D03, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 11/01/96 on instrument R exceeded the 30% QC limit for acetone (39.3%) and dichlorodifluoromethane (34.6%). There were no positive results for these compounds in the associated samples, so no action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) for the standards analyzed on 11/22/96 at 09:39 on instrument K were below the 0.005 QC limit for the following compounds:

2-chloroethyl vinyl ether	0.018
acrolein	0.023

propionitrile	0.045
isobutyl alcohol	0.004
1,4-dioxane	0.002

The non-detect results for 2-chloroethyl vinyl ether and propionitrile in associated blanks GDEDW16D03, GDEEW16D03 and GDEFW16D03 and sample GDEHW019D03, which consisted entirely of non-detects, were rejected (R). The results for the other compounds in these samples were previously rejected based on the initial calibration.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/22/96 at 09:39 on instrument K for the following compounds:

acetone	26.4%
vinyl acetate	28.0%
trans-1,4-dichloro-2-butene	25.3%
dichlorodifluoromethane	36.5%

The results for these compounds in associated sample GDEHW19D03, 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 necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Acetone, methylene chloride and chloroform were detected at 5 ug/L, 7 ug/L and 3 ug/L, respectively, in deionized water blank GDEDW16D03. The positive result for methylene chloride in associated sample GDEHW19D03, which was less than 10X the blank amount, was flagged as undetected (U) with the detection limit being raised to the level of contamination in the sample. There were no positive results for the other compounds in the associated sample. No further action was required.

Acetone, methylene chloride, carbon disulfide, chloroform and tetrachloroethene were detected at 6 ug/L, 7 ug/L, 2 ug/L, 3 ug/L and 2 ug/L, respectively, in equipment rinsate blank GDEEW16D03. The positive result for methylene chloride in the associated sample was previously flagged. The other compounds were not detected in the associated sample. No further action was required.

Methylene chloride and chloroform were detected at 8 ug/L and 3 ug/L, respectively, in field blank GDEFW16D03. The positive result for methylene chloride in the associated sample was previously flagged. The other compound was not detected in the associated sample, so no action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. 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 required.

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 acrolein, propionitrile, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in blanks GDEDW16D03, GDEEW16D03, GDEFW16D03 and sample GDEHW019D03 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:

The average Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 11/27/96 on instrument A for aramite (0.048) and hexachlorophene (0.040). The results for these compounds in associated deionized water blank GDEDW16D03, 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 11/27/96 on instrument A for the following compounds:

methyl methanesulfonate	38.5%
n-nitrosomethylethylamine	30.3%
n-nitrosodiethylamine	31.8%
ethyl methanesulfonate	34.3%
acetophenone	35.3%
n-nitrosopyrrolidine	34.6%
2-picoline	40.8%
p-phenylenediamine	44.7%
m-cresol	32.7%
n-nitrosomorpholine	37.5%
o-toluidine	35.7%
n-nitroso-piperidine	33.7%
o,o,o-triethyl phosphorothionate	32.8%
2,6-dichlorophenol	33.6%
n-nitroso-di-n-butylamine	36.2%
safrole	33.4%
isosafrole	36.3%
1,4-naphthoquinone	40.3%
1,3-dinitrobenzene	32.0%
1-naphthylamine	38.0%
4-nitroquinoline-1-oxide	46.9%
2-naphthylamine	36.1%
thionazin	34.6%
pentachlorobenzene	34.2%
diphenylamine	33.7%
sulfotepp	37.2%

1,3,5-trinitrobenzene	33.7%
phorate	44.8%
phenacetin	35.0%
diallate	30.6%
dimethoate	34.3%
4-aminobiphenyl	39.8%
pronamide	39.2%
pentachloronitrobenzene	34.2%
disulfoton	32.8%
methyl parathion	33.1%
parathion	35.7%
methapyrilene	44.9%
isodrin	36.1%
chlorobenzilate	36.1%
3,3'-dimethylbenzidine	43.4%
kepone	43.9%
famphur	65.0%
2-acetylaminofluorene	36.0%
7,12-dimethylbenz(a)anthracene	34.9%
hexachlorophene	49.0%

There were no positive results for these compounds in the associated blank. No action was required.

The average Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 12/19/96 on instrument A for hexachlorophene (0.040). The results for this compound in associated blanks GDEEW16D03, GDEFW16D03 and sample GDEHW19D03, 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 12/19/96 on instrument A for the following compounds:

methyl methanesulfonate	36.5%
ethyl methanesulfonate	36.3%
2-picoline	42.8%
n-nitrosopyrrolidine	35.2%
m-cresol	32.7%
n-nitrosomorpholine	31.3%
o-toluidine	38.4%
o,o,o-triethyl phosphorothionate	32.8%
2,6-dichlorophenol	34.1%
hexachloropropene	32.1%
1,2,4,5-tetrachlorobenzene	36.1%
safrole	34.9%
isosafrole	33.3%
1,4-naphthoquinone	38.8%
1,3-dinitrobenzene	43.1%
pentachlorobenzene	35.0%
1-naphthylamine	43.0%

4-nitroquinoline-1-oxide	47.0%
2-naphthylamine	44.9%
thionazin	30.9%
diphenylamine	33.6%
sulfotepp	37.2%
1,3,5-trinitrobenzene	33.7%
phorate	32.0%
phenacetin	35.2%
diallate	30.9%
dimethoate	38.2%
4-aminobiphenyl	42.8%
pronamide	37.4%
pentachloronitrobenzene	35.9%
disulfoton	35.7%
methyl parathion	39.7%
parathion	36.2%
methapyrilene	51.0%
chlorobenzilate	30.9%
3,3'-dimethylbenzidine	38.6%
kepone	43.9%
famphur	76.4%
7,12-dimethylbenz(a)anthracene	34.8%

The % RSD for famphur was greater than 70%, so the non-detect result for this compound in associated sample GDEHW19D03 was flagged as estimated (UJ).

Continuing Calibration:

The Relative Response Factor (RRF) for hexachlorophene (0.035) in the standard analyzed on 12/09/96 at 09:42 on instrument A was below the 0.050 QC limit. The result for this compound in associated blank GDEDW16D03 was previously rejected. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/09/96 at 09:42 on instrument A for the following compounds:

methyl methanesulfonate	65.6%
n-nitrosodimethylamine	25.3%
n-nitrosodiethylamine	31.2%
ethyl methanesulfonate	73.0%
acetophenone	51.8%
n-nitrosopyrrolidine	37.5%
2-picoline	54.7%
n-nitrosomorpholine	41.5%
o-toluidine	58.8%
n-nitroso-piperidine	31.9%
o,o,o-triethyl phosphorothionate	41.8%
safrole	56.7%
isosafrole	34.8%

1,3-dinitrobenzene	73.9%
1-naphthylamine	31.7%
2-naphthylamine	44.0%
thionazin	44.1%
phorate	69.7%
phenacetin	26.9%
diallate	42.1%
dimethoate	54.1%
pronamide	29.8%
4-aminobiphenyl	37.2%
pentachloronitrobenzene	55.0%
disulfoton	51.0%
methyl parathion	66.7%
parathion	41.9%
methapyrilene	33.8%
isodrin	47.3%
chlorobenzilate	33.4%
famphur	66.0%
m-cresol	45.8%
4-nitroquinoline-1-oxide	37.2%
diphenylamine	60.2%
sulfotepp	54.7%
benzoic acid	41.4%
p-phenylenediamine	38.2%

No action was required, since the associated sample was a field blank.

The Relative Response Factor (RRF) for hexachlorophene (0.022) was below the 0.050 QC limit for the standards analyzed on 12/19/96 at 09:27 on instrument A. The non-detect results for this compound 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 12/19/96 at 09:27 on instrument A for the following compounds:

methyl methanesulfonate	72.8%
n-nitrosodimethylamine	32.1%
n-nitrosodiethylamine	98.7%
ethyl methanesulfonate	53.4%
acetophenone	51.6%
n-nitrosopyrrolidine	32.2%
2-picoline	76.0%
n-nitrosomorpholine	37.7%
o-toluidine	54.9%
n-nitroso-piperidine	31.6%
safrole	46.8%
isosafrole	38.6%
1,3-dinitrobenzene	25.2%
1-naphthylamine	46.4%

2-naphthylamine	54.2%
phorate	29.4%
pronamide	30.2%
4-aminobiphenyl	46.1%
pentachloronitrobenzene	61.8%
chlorobenzilate	31.4%
famphur	101%
m-cresol	58.0%
diphenylamine	60.4%
sulfotepp	92.1%
p-phenylenediamine	75.6%
hexachlorophene	46.6%

The non-detect results for hexachlorophene in the associated samples were previously rejected. The results for the other compounds in associated sample GDEHW19D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 2 ug/L in method blank SBLK1. Since the only associated sample was a field blank, no action was required.

Deionized Water Blank:

Bis(2-ethylhexyl)phthalate was detected at 1 ug/L in GDEDW16D03. This compound was not detected in the associated sample, so no action was required.

Equipment Rinsate and Field Blanks:

There were no positive detections in these two field blanks. No action was taken.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS criteria were not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG, so no action was required.

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 result for aramite and hexachlorophene were rejected in sample GDEHW19D03 and field blanks GDEDW16D3, GDEEW16D03 and GDEFW16D03 because of low RRF's in the initial calibration. 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 Difference (%D) was 25.4% for beta-BHC in the PEM standards analyzed on 11/27/96 at 16:31 on the primary column, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample GDEHW19D03 was flagged as estimated (UJ).

The Percent Resolution (%R) of methoxychlor was 14.2% for the standards analyzed on 11/15/96 on the primary column, which was below the 60% QC limit. The non-detect result for this compound in associated sample GDEHW19D03 was flagged as estimated (UJ).

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.

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 required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification 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 in this SDG. No action was necessary.

IX.) 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.

X.) 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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB1	aluminum	39.8 ug/L	199 ug/L
CCB1	barium	1.60 ug/L	8.00 ug/L
GDEEW16D03	calcium	40.0 ug/L	200 ug/L
CCB3	chromium	1.10 ug/L	5.50 ug/L
GDEEW16D03	cobalt	1.20 ug/L	6.00 ug/L
GDEDW16D03	iron	3.50 ug/L	17.5 ug/L
CCB3	nickel	1.00 ug/L	5.00 ug/L
CCB3	potassium	56.2 ug/L	281 ug/L
GDEFW16D03	thallium	5.80 ug/L	29.0 ug/L
CCB3	tin	3.10 ug/L	15.5 ug/L
GDEDW16D03	vanadium	0.79 ug/L	3.95 ug/L
GDEDW16D03	zinc	8.40 ug/L	42.0 ug/L
CCB2	cyanide	3.20 ug/L	16.0 ug/L

CCB = Continuing Calibration Blank, GDEDW16D03 = Deionized Water Blank, GDEEW16D03 = Equipment Rinsate Blank, GDEFW16D03 = Field 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, 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	magnesium	-64.7 ug/L	324 ug/L
CCB2	silver	-1.30 ug/L	6.50 ug/L

CCB = Continuing Calibration Blank

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	7 ug/L
chromium	1 ug/L
nickel	3 ug/L
tin	5 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
cadmium	-1 ug/L
copper	-2 ug/L
lead	-5 ug/L
potassium	-207 ug/L
thallium	-5 ug/L
vanadium	1 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the sample 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 Analysis criteria was met. No action was required.

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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Field duplicate samples ets 573HW00103 / 573GW00103 and GDEGW19D03 / GDEHW19D03 were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	573GW00103, ug/L	573HW00103, ug/L	RPD
barium	33.5	34.6	3.2%
calcium	96100	101000	9.3%
iron	4120	4330	5.0%
magnesium	18800	19600	4.2%
manganese	288	300	4.1%
potassium	11200	11700	4.4%
sodium	25800	26800	3.8%

None of the Relative Percent Differences (RPD's) for this set exceeded the 30% QC limit for water samples, so no action was required.

Analyte	GDEGW19D03, ug/L	GDEHW19D03, ug/L	RPD
calcium	108000	109000	0.9%
iron	185	189	2.1%
magnesium	7140	7270	1.8%
manganese	41.9	42.6	1.7%
potassium	3560	3540	0.6%
sodium	42800	86300	67.3%

The RPD for sodium in this set exceeded the 30% QC limit for water samples. The positive results for this analyte in these two 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 required.

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.

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, Equipment Rinsate and Field Blanks:

Chlorides were 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.) 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 chlorides in field duplicate samples GDEGW19D03 (analyzed in SDG 27678B) and GDEHW19D03 was 0.4%, which was within the 30% QC limit for water samples. No action was required.

The calculable Relative Percent Difference (RPD) for chlorides in field duplicate samples

573GW00103 (analyzed in SDG 27678B) and 573HW00103 was 1.1%, which 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.

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:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were 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.) 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 sulfates in field duplicate samples GDEGW19D03 (analyzed in SDG 27678B) and GDEHW19D03 was 1.8%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for sulfates in field duplicate samples 573GW00103 (analyzed in SDG 27678B) and 573HW00103 was not calculable. 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.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS 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.) 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 TDS in field duplicate samples GDEGW19D03 (analyzed in SDG 27678B) and GDEHW19D03 was 2.6%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for TDS in field duplicate samples 573GW00103 (analyzed in SDG 27678B) and 573HW00103 was 1.7%, which 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 Laboratories of Oklahoma, Inc. - 27678B CLP Organics and Inorganics

SAMPLES: 570GW00203, 570GW02D03, 570GW03D03, 572GW00103, 572GW00203, 572GW00303, 573GW00103, 573GW01D03, GDEGW01603, GDEGW01703, GDEGW01703MS, GDEGW01703MSD, GDEGW01903, GDEGW16D03, GDEGW17D03, GDEGW19D03, GDEGW19D03MS, GDEGW19D03MSD GDETW01703, GDETW19D03

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 11/01/96 on instrument R for the following compounds:

bromomethane	30.2%
chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%

These compounds were not detected in the associated samples, so no action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/21/96 at 11:58 on instrument R for the following compounds:

2-butanone	27.2%
vinyl acetate	76.3%
trans-1,3-dichloropropene	32.6%
2-hexanone	28.0%

The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 572GW00103, 572GW00203, 572GW00303, GDEGW01703, GDEGW17D03 and GDEGW01603.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/22/96 at 11:35 on instrument R for methylene chloride (44.7%) and vinyl acetate (43.2%). The results for these compounds in associated samples 570GW02D03, 570GW03D03 and GDEGW16D03, which were all non-detects after blank qualifications, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/25/96 at 09:45 on instrument R for the following compounds:

chloromethane	28.3%
bromomethane	26.8%
chloroethane	39.8%
acetone	53.6%
2-butanone	25.7%
vinyl acetate	63.6%
2-chloroethyl vinyl ether	45.1%

The results for these compounds in associated samples 570GW00203, GDEGW01903 and GDEGW19D03, 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.

Deionized Water Blanks:

Acetone, methylene chloride and chloroform were detected at 5 ug/L, 7 ug/L and 3 ug/L, respectively, in deionized water blank GDEDW16D03, which was analyzed in SDG 27678A. The positive results for acetone and methylene chloride in associated samples 570GW03D03 and GDEGW16D03, which were less than 10X the blank amounts, were flagged as undetected (U) with the detections limits being raised to the level of contamination in each sample. There were no positive results for chloroform in the associated samples, so no action was required.

Equipment Rinsate Blank:

Acetone, methylene chloride, carbon disulfide, chloroform and tetrachloroethene were detected at 6 ug/L, 7 ug/L, 2 ug/L, 3 ug/L and 2 ug/L, respectively, in equipment rinsate blank GDEEW16D03, which was analyzed in SDG 27678A. The positive results for methylene chloride and acetone in the associated samples were previously flagged. The other compounds were not detected in the associated sample, so no further action was required.

Field Blank:

Methylene chloride and chloroform were detected at 8 ug/L and 3 ug/L, respectively, in field blank GDEFW16D03, which was analyzed in SDG 27678A. The positive results for methylene chloride in the associated samples were previously flagged. Chloroform was not detected in the associated samples, so no action was required.

Trip Blanks:

There were no positive detections in the trip blanks associated with this SDG. No action was required.

TIC's:

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) of trichloroethene in spiked sample GDEGW01703MSD was 124%, which exceeded the 71-120% QC limit. The result for this compound in associated unspiked sample GDEGW01703 was a non-detect. No action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. Several Percent Recoveries (%R's) were outside their respective QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction in the SDG, so no action was required.

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 required.

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) was 30.8% for 2,4-dinitrophenol for the standards analyzed on 12/03/96 on instrument M, which exceeded the 30% QC limit. No action was required, since there were no positive results for this compound in the associated samples.

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 12/04/96 on instrument V exceeded the 30% QC limit for the following compounds:

4-methylphenol	32.1%
naphthalene	32.0%
2,4-dinitrophenol	40.3%
benzo(g,h,i)perylene	36.2%

No action was required since these compounds were not detected in the associated samples.

Continuing Calibration:

The Percent Difference (%D) of 2,4-dinitrophenol was 39.7% for the standards analyzed on 12/04/96 at 09:02 on instrument M, which exceeded the 30% QC limit. The results for this compound in associated samples GDEGW01703, GDEGW17D03 and GDEGW01603, 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 12/05/96 at 06:55 on instrument V for the following compounds:

benzoic acid	33.3%
2,4-dinitrophenol	64.8%
4,6-dinitro-2-methylphenol	40.8%
benzo(g,h,i)perylene	25.2%

The results for these compounds in associated samples GDEGW16D03, GDEGW01903 and GDEGW19D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks for this SDG. No action was required.

Deionized Water Blank:

Bis(2-ethylhexyl)phthalate was detected at 1 ug/L in deionized water blank GDEDW16D03, which was analyzed in SDG 27678A. The positive result for this compound in associated sample GDEGW01603, 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.

Equipment Rinsate and Field Blanks:

There were no positive detections in the two field blanks, which were analyzed in SDG 27678A. No action was necessary.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) exceeded the 35-114% QC limit for nitrobenzene-d5 (126%) in sample GDEGW01703. Since only one surrogate %R in the base-neutral fraction exceeded the QC limits, no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) were outside their respective QC limits for spiked samples GDEGW01703MS and GDEGW01703MSD for the following compound:

Compound	MS, %R	MSD, %R	QC Limits
4-nitrophenol	90	95	10-80 %

Since this compound was not detected in unspiked sample GDEGW01703, no action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (%RPD's) for the field duplicate samples in this fraction in this SDG, so no action was required.

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.

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 required.

III.) Calibration:

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

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 27678A. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Differences (RPD's) for spiked samples GDEGW19D03MS and GDEGW19D03MSD exceeded their QC limits for the following compounds:

Compound	RPD	QC Limit
endrin aldehyde	23%	20%
methoxychlor	22%	20%

The non-detect results for these compounds in associated unspiked sample GDEGW19D03 were flagged as estimated (UJ).

The Percent Recoveries (%R's) for spiked sample GDEGW19D03MSD were below their QC limits for the following compounds:

Compound	MSD,%R	QC Limits
4,4'-DDE	67%	70-122%
4,4'-DDD	68%	70-133%

The non-detect results for these compounds in associated unspiked sample GDEGW19D03 were flagged as estimated (UJ).

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification 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 in this SDG. No action was necessary.

IX.) 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.

X.) 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 and Continuing Calibration criteria were met. No action was required.

III.) Blanks:

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

Blank ID#	Analyte	Max. Conc.	Action Level
CCB1	aluminum	39.8 ug/L	199 ug/L
CCB1	barium	1.60 ug/L	8.00 ug/L
GDEEW16D03	calcium	40.0 ug/L	200 ug/L
CCB3	chromium	1.10 ug/L	5.50 ug/L
GDEEW16D03	cobalt	1.20 ug/L	6.00 ug/L
GDEDW16D03	iron	3.50 ug/L	17.5 ug/L
CCB3	nickel	1.00 ug/L	5.00 ug/L
CCB3	potassium	56.2 ug/L	281 ug/L
PBW	sodium	110 ug/L	550 ug/L
GDEFW16D03	thallium	5.80 ug/L	29.0 ug/L
CCB3	tin	3.10 ug/L	15.5 ug/L
GDEDW16D03	vanadium	0.79 ug/L	3.95 ug/L
GDEDW16D03	zinc	8.40 ug/L	42.0 ug/L
CCB2	cyanide	3.20 ug/L	16.0 ug/L

CCB = Continuing Calibration Blank, PBW= Preparation Blank (Water)
EW = Equipment Rinsate Blank, FW = Field Blank, DW = Deionized Water 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, preparation or field blank were flagged as undetected (U).

The following analytes had negative results with absolute values greater than the IDL in the continuing calibration blanks (CCB's):

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	magnesium	-64.7 ug/L	323 ug/L
CCB4	silver	-1.40 ug/L	7.00 ug/L

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	7 ug/L
chromium	1 ug/L
nickel	3 ug/L
tin	5 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
cadmium	-1 ug/L
copper	-2 ug/L
lead	-5 ug/L
potassium	-207 ug/L
thallium	-5 ug/L
vanadium	-1 ug/L

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

V.) ICP Serial Dilution Analysis:

The Percent Recovery (%R) of potassium was 11.2% for the serial dilution sample, which exceeded

the 10% QC limit. All positive results for this analyte in the associated 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 573HW00103 (analyzed in SDG 27678A) / 573GW00103 and GDEHW19D03 (analyzed in SDG 27678A) / GDEGW19D03, were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	573GW00103, ug/L	573HW00103, ug/L	RPD
barium	33.5	34.6	3.2%
calcium	96100	101000	9.3%
iron	4120	4330	5.0%
magnesium	18800	19600	4.2%
manganese	288	300	4.1%
potassium	11200	11700	4.4%
sodium	25800	26800	3.8%

None of the RPD's in this set exceeded the 30% QC limit for water samples, so no action was required.

Analyte	GDEGW19D03, ug/L	GDEHW19D03, ug/L	RPD
calcium	108000	109000	0.9%
iron	185	189	2.1%
magnesium	7140	7270	1.8%
manganese	41.9	42.6	1.7%
potassium	3560	3540	0.6%
sodium	42800	86300	67%

The RPD for sodium in this set exceeded the 30% QC limit for water samples. The positive results for this analyte in these two 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 27678A. No action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. 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 chlorides in field duplicate samples GDEGW19D03 and GDEHW19D03 (analyzed in SDG 27678A) was 0.3%, which was within the 30% QC limit for water samples. No action was required.

The RPD for chlorides in field duplicate samples 596GW00103 and 596HW00103 (analyzed in SDG 27678A) was not calculable. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 27678A. 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) for sulfates in field duplicate samples GDEGW19D03 and GDEHW19D03 (analyzed in SDG 27678A) was 0.5%, which was within the 30% QC limit for water samples. No action was required.

The RPD for sulfates in field duplicate samples 596GW00103 and 596HW00103 (analyzed in SDG 27678A) was 3.6%, which 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 in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 27678A. 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) for TDS in field duplicate samples GDEGW19D03 and GDEHW19D03 (analyzed in SDG 27678A) was 7.5%, which was within the 30% QC limit for water samples. No action was required.

The RPD for TDS in field duplicate samples 596GW00103 and 596HW00103 (analyzed in SDG 27678A) was 8.5%, which 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.

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:	0174
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Levels III & IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27716A (Level IV) 27716B (Level III)

SAMPLES:

SDG 27716A (Level IV)

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Total Metals	Chlorides	Sulfates	TDS
569HW00203*	27738.02	Water	X	X	X	X	X
569HW01D03*	27738.01	Water	X	X	X	X	X

* = Field duplicates were associated with samples 569GW00203 and 569GW01D03 in SDG 27716B.

SDG 27716B (Level III)

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
559GW00203	27737.06	Water	X			X
563GW00103	27716.03	Water	X			X
563GW01D03	27716.04	Water	X			X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
569GW00103	27737.03	Water	X	X		X
569GW00203*	27737.05	Water	X			X
569GW01D03*	27737.04	Water	X			X
570GW00103	27716.01	Water	X			X
570GW00303	27716.02	Water	X			X
GDEGW02003	27716.05	Water	X	X	X	X
GDEGW02103	27716.07	Water	X	X	X	X
GDEGW02203	27737.01	Water	X	X	X	X
GDEGW20D03	27716.06	Water	X	X	X	X
GDEGW21D03	27716.08	Water	X	X	X	X
GDEGW22D03	27737.02	Water	X	X	X	X
569TW00203	27737.07	Water	X			
GDETW21D03	27716.09	Water	X			
559GW00203MS	27737.06MS	Water		+		
559GW00203MSD	27737.06MSD	Water		+		
GDEGW20D03MS	27716.06MS	Water	+		+	
GDEGW20D03MSD	27716.06MSD	Water	+		+	
GDEGW02203MS	27737.01MSD	Water	+			
GDEGW02203MSD	27737.01MSD	Water	+			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
559GW00203	27737.06	Water		X	X	X
563GW00103	27716.03	Water		X	X	X
563GW01D03	27716.04	Water		X	X	X
569GW00103	27737.03	Water		X	X	X
569GW00203*	27737.05	Water		X	X	X
569GW01D03*	27737.04	Water		X	X	X
570GW00103	27716.01	Water		X	X	X
570GW00303	27716.02	Water		X	X	X
GDEGW02003	27716.05	Water	X	X	X	X
GDEGW02103	27716.07	Water	X	X	X	X
GDEGW02203	27737.01	Water	X	X	X	X
GDEGW20D03	27716.06	Water	X	X	X	X
GDEGW21D03	27716.08	Water	X	X	X	X
GDEGW22D03	27737.02	Water	X	X	X	X

+ = Non-billable Quality Control sample
* = Samples were associated with field duplicates 569HW00203 and 569HW01D03 in SDG 27716A.

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27716A Appendix IX CLP Organics and Inorganics

SAMPLES: 569HW00203, 569HW01D03

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 the standards analyzed on 11/1/96 on instrument R were below the 0.050 QC limit for the following compounds:

acrolein	0.042
trans-1,4-dichloro-2-butene	0.049
isobutyl alcohol	0.006
1,4-dioxane	0.002

All results for these compounds in the two SDG samples, 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 11/01/96 on instrument R for the following compounds:

chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%
acrolein	54.0%
trans-1,4-dichloro-2-butene	52.8%
dichlorodifluoromethane	38.7%

The results for acrolein in the two SDG samples were previously rejected because of a low RRF in this calibration. There were no positive results for the other compounds in the two samples. No further action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) for the standard analyzed on 11/25/96 at 09:46 on instrument R were below the 0.050 QC limit for the following compounds:

acrolein	0.040
isobutyl alcohol	0.004
1,4-dioxane	0.002

All results for these compounds in the two SDG samples, which consisted entirely of non-detects, were previously rejected because of low RRF's in the initial calibration. No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/25/96 at 09:45 on instrument R for the following compounds:

chloromethane	28.3%
bromomethane	26.8%
chloroethane	39.8%
acetone	53.5%
2-butanone	25.7%
vinyl acetate	63.6%
2-chloroethyl vinyl ether	45.1%
dichlorodifluoromethane	50.9%
isobutyl alcohol	33.3%
1,2-dibromo-3-chloropropane	39.8%

The results for isobutyl alcohol in the two SDG samples were previously rejected because of a low RRF in the initial calibration. The results for the other compounds in the two samples, 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 required.

Trip Blank:

There were no positive detections in associated trip blank 569TW00203, which was analyzed in SDG 27716B. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two field duplicate samples in this SDG. No action was required.

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 acrolein, trans-1,4-dichloro-2-butene, isobutyl alcohol and 1,4-dioxane were rejected because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualifications.

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:

All Continuing Calibration criteria were met. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB5	antimony	4.30 ug/L	21.5 ug/L
PBW	calcium	19.8 ug/L	99.0 ug/L
CCB5	thallium	3.00 ug/L	15.0 ug/L
PBW	tin	3.28 ug/L	16.4 ug/L
PBW	zinc	18.5 ug/L	92.5 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB1	arsenic	-2.90 ug/L	14.5 ug/L
CCB3	copper	-1.50 ug/L	7.50 ug/L
ICB	nickel	-0.90 ug/L	4.50 ug/L
ICB	silver	-1.80 ug/L	9.00 ug/L
CCB2	thallium	-3.10 ug/L	15.5 ug/L
ICB	vanadium	-0.60 ug/L	3.00 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank

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	5 ug/L
chromium	1 ug/L
lead	4 ug/L

nickel	2 ug/L
selenium	6 ug/L
tin	7 ug/L

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

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

barium	-1 ug/L
cadmium	-1 ug/L
cobalt	-1 ug/L
copper	-1 ug/L
silver	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

ICP 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 569HW00203 / 569GW00203 (analyzed in SDG 27716B) and 569HW01D03 / 569GW01D03 (analyzed in SDG 27716B), were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	569HW00203, ug/L	569GW00203, ug/L	RPD
calcium	19200	19300	0.5%
iron	175	185	5.6%
manganese	76.2	77.2	1.3%
sodium	12500	13000	3.9%

Analyte	569HW01D03, ug/L	569GW01D03, ug/L	RPD
calcium	69400	70500	1.6%
iron	5829	848	2.3%
magnesium	8530	8590	0.7%
manganese	123	124	0.8%
sodium	42200	42600	0.9%

None of the RPD's exceeded 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 required.

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.

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:

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):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Samples 569HW00203 and 569HW01D03 were analyzed in this SDG while corresponding samples 569GW00203 and 569GW01D03 were analyzed in SDG 27716B. The Relative Percent Differences (RPD's) for chlorides were 2.6% and 0.8%, respectively, for the two field duplicate pairs, which were within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

Samples 569HW00203 and 569HW01D03 were analyzed in this SDG while duplicate samples 569GW00203 and 569GW01D03 were analyzed in SDG 27716B. The Relative Percent Differences (RPD's) for sulfates were 1.1% and 1.4%, respectively, for the two field duplicate pairs, which were within the 30% QC limit for water samples. No action was taken.

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:

TDS 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.) 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:

Samples 569HW00203 and 569HW01D03 were analyzed in this SDG while corresponding samples 569GW00203 and 569GW01D03 were analyzed in SDG 27716B. The Relative Percent Differences (RPD's) for TDS were 14.8% and 20.9%, respectively, for the two field duplicate pairs, which were within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27716B CLP Organics and Inorganics

SAMPLES: 559GW00203, 563GW00103, 563GW01D03, 569GW00103, 569GW00203, 569GW01D03, 570GW00103, 570GW00303, GDEGW02003, GDEGW02103, GDEGW02203, GDEGW20D03, GDEGW21D03, GDEGW22D03, 560TW21D03, GDETW21D03, 559GW00203MS, 559GW00203MSD, GDEGW20D03MS, GDEGW20D03MSD, GDEGW02203MS, GDEGW02203MSD

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) was 39.3% for acetone in the standards analyzed on 10/11/96 on instrument K, which exceeded the 30% QC limit. The positive result for acetone in associated sample 569GW00203 was flagged as estimated (J). Since there were no other positive detections of acetone in the associated samples, no further action was necessary.

The Percent Relative Standard Deviations (%RSD's) for chloroethane (30.6%), vinyl acetate (50.5%) and 2-chloroethyl vinyl ether (54.0%) exceeded the 30% QC limits for the standards analyzed on 11/1/96 on instrument R. There were no positive detections of these compounds in the associated samples. No action was taken.

Continuing Calibration:

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.018 for the standard analyzed on 11/22/96 at 09:39 on instrument K, which was below the 0.050 QC limit. The results for this compound in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were 563GW00103, 563GW01D03, 570GW00103, 570GW00303 and GDEGW02003.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/22/96 at 09:39 on instrument K for the following compounds:

acetone	26.4%
2-chloroethyl vinyl ether	74.3%
vinyl acetate	28.0%

The results for 2-chloroethyl vinyl ether in the associated samples were previously rejected based on a low RRF in this calibration. The remaining results for acetone and vinyl acetone in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 563GW00103, 563GW01D03, 570GW00103, 570GW00303 and GDEGW02003.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.018 for the standard analyzed on 11/27/96 at 05:06 on instrument K, which was below the 0.050 QC limit. The results for this compound in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were 559GW00203, 569GW00103, 569GW00203, 569GW01D03, GDEGW02203, GDEGW22D03 and trip blank 569TW00203.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/27/96 at 05:06 on instrument K for the following compounds:

2-chloroethyl vinyl ether	74.3%
chloromethane	30.5%
acetone	46.7%

The associated non-detect results for 2-chloroethyl vinyl ether were previously rejected because of a low RRF in this calibration. The positive result for acetone in sample 569GW00203 was previously flagged based on a high %RSD in the initial calibration. The remaining results for acetone and chloromethane in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 559GW00203, 569GW00103, 569GW00203, 569GW01D03, GDEGW02203 and GDEGW22D03.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 11/25/96 at 09:45 on instrument R for the following compounds:

chloromethane	28.3%
bromomethane	26.8%
chloroethane	39.8%
2-chloroethyl vinyl ether	45.1%
acetone	53.6%
2-butanone	25.7%
vinyl acetate	63.6%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDEGW20D03, GDEGW02103 and GDEGW21D03.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Trip Blanks:

There were no positive detections in the two trip blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of the following compounds in spiked samples GDEGW20D03MS and GDEGW20D03MSD exceeded their respective QC limits:

Compound	MS, %R	MSD, %R	QC Limits
trichloroethene	144	146	71-120%
benzene	144	146	76-127%
toluene	144	146	76-125%
chlorobenzene	148	152	75-130%

There were no positive detections of these compounds in unspiked sample GDEGW20D03. No action was taken. All Percent Recovery criteria were met for the second set of MS / MSD's.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two sets of field duplicate samples. No action was necessary.

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 in samples 559GW00203, 563GW00103, 563GW01D03, 569GW00103, 569GW00203, 569GW01D03, 570GW00103, 570GW00303, GDEGW00103, GDEGW002003, GDEGW02203, GDEGW22D03 and trip blank 569TW00203 were rejected based on low RRF's in the 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:

The Percent Relative Standard Deviation (%RSD) for 2,4-dinitrophenol was 30.8% for the standards analyzed on 12/3/96 on instrument M, which exceeded the 30% QC limit. There were no positive detections of this compound in the associated samples. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol were 50.1% and 29.2%, respectively, for the standard analyzed on 12/5/96 at 08:57 on instrument M, which exceeded the 25% QC limit. All results for these compounds in associated samples 559GW00203, GDEGW02203 and GDEGW22D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

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 required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (R's) of 4-nitrophenol were 90% in both spiked samples 559GW00203MS and 559GW00203MSD, which exceeded the 10-80% QC limits. This compound was not detected in unspiked sample 559GW00203. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. One Percent Recovery (%R) exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was required.

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.

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 required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) for delta-BHC and 4,4'-DDE were 31.2% and 67.6%, respectively, on the secondary column for the standards analyzed on 12/4/96, which exceeded the 20% QC limit. The non-detect results for these two compounds in associated sample GDEGW22D03 were flagged as estimated (UJ).

Continuing Calibration:

The Percent Difference (%D) for 4,4'-DDE was 56.1% on the secondary column for the standard analyzed on 12/5/96 at 13:21, which exceeded the 25% QC limit. Qualification of this compound in sample GDEGW22D03 was previously performed based on the initial calibration.

The Percent Differences (%D's) were 31.1% and 28.3% for heptachlor and methoxychlor, respectively, on the primary column for the standards analyzed on 12/3/96 at 01:35, which exceeded the 25% QC limit. The non-detect results for these compounds in associated sample GDEGW02203 were flagged as estimated (UJ).

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 required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Differences (RPD's) for heptachlor (122%), endosulfan II (23%) and endrin ketone (33%) in spiked samples GDEGW22D03MS and GDEGW22D03MSD exceeded their respective 20% QC limit. The non-detect results for these compounds in unspiked sample GDEGW22D03 were flagged as estimated (UJ).

The Percent Recoveries (%R's) of the following compounds in spiked samples GDEGW20D03 and GDEGW20D03MSD were below their respective QC limits:

Compound	MS, %R	MSD, %R	QC Limits
heptachlor	7	29	39-128%
endosulfan I	43		46-134%
4,4'-DDD	63	58	70-133%
endrin aldehyde	2	2	47-178%
endrin ketone	40		49-161%

The non-detect results for endosulfan I, 4,4'-DDD and endrin ketone in unspiked sample GDEGW20D03 were flagged as estimated (UJ). The non-detect results for heptachlor and endrin aldehyde in this sample were rejected since the %R's were less than 10%.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

X.) Overall Assessment of Data/General:

The non-detect results for heptachlor and endrin aldehyde were rejected in sample GDEGW20D03 because of low (less than 10%) %R's in the MS / MSD samples. 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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB5	antimony	4.30 ug/L	21.5 ug/L
PBW	calcium	19.8 ug/L	99.0 ug/L
CCB5	thallium	3.00 ug/L	15.0 ug/L
PBW	tin	3.28 ug/L	16.4 ug/L
PBW	zinc	18.5 ug/L	92.5 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB1	arsenic	-2.90 ug/L	14.5 ug/L
CCB3	copper	-1.50 ug/L	7.50 ug/L
ICB	nickel	-0.90 ug/L	4.50 ug/L
ICB	silver	-1.80 ug/L	9.00 ug/L
CCB2	thallium	-3.10 ug/L	15.5 ug/L
ICB	vanadium	-0.60 ug/L	3.00 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank

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	5 ug/L
chromium	1 ug/L
lead	4 ug/L
nickel	2 ug/L
selenium	6 ug/L
tin	7 ug/L

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

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

barium	-1 ug/L
cadmium	-1 ug/L
cobalt	-1 ug/L
copper	-1 ug/L
silver	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

The Serial Dilution Percent Differences (%D's) for aluminum (61.7%) and iron (10.5%) exceeded the 10% QC limit for serial dilution sample 570GW00103L. All positive results for these two analytes in the 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 569GW00203 / 569HW00203 (analyzed in SDG 27716A) and 569GW01D03 / 569HW01D03 (analyzed in SDG 27716A), were analyzed by the laboratory. All calculable RPD's were within the 30% QC limit for water samples. See SDG 27716A for RPD calculations.

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 required.

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.

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:

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):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Samples 569GW00203 and 569GW01D03 were analyzed in this SDG while duplicate samples 569HW00203 and 569HW01D03 were analyzed in SDG 27716A. The Relative Percent Differences (RPD's) for chlorides were 2.6% and 0.8%, respectively, for the two field duplicate pairs, which were within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

Samples 569GW00203 and 569GW01D03 were analyzed in this SDG while duplicate samples 569HW00203 and 569HW01D03 were analyzed in SDG 27716A. The Relative Percent Differences (RPD's) for sulfates were 1.1% and 1.4%, respectively, for the two field duplicate pairs, which were within the 30% QC limit for water samples. No action was taken.

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:

TDS 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.) 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:

Samples 569GW00203 and 569GW01D03 were analyzed in this SDG while duplicate samples 569HW00203 and 569HW01D03 were analyzed in SDG 27716A. The Relative Percent Differences (RPD's) for TDS were 14.8% and 20.9%, respectively, for the two field duplicate pairs, which were within the 30% QC limit for water samples. No action was taken.

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:	0175
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Levels III and IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chloride, Sulfate, Total Dissolved Solids (TDS)
SDG NUMBER:	27754A (Level IV) 27754B (Level III)

SAMPLES:

SDG 27754A (Level IV)

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Total Metals
559HW03D03*	27780.01	Water	X	X	X

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
559HW03D03*	27780.01	Water	X	X	X

* = Corresponding sample was analyzed in SDG 27754B.

H = FIELD DUPLICATE

SDG 27754B (Level III)

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
549GW00103	27779.01	Water	X			X
549GW00203	27779.02	Water	X			X
549GW00303	27779.03	Water	X			X
559GW00103	27754.03	Water	X	X		X
559GW00303	27779.06	Water	X	X		X
559GW00403	27779.04	Water	X	X		X
559GW00503	27754.04	Water	X	X		X
559GW03D03*	27779.07	Water	X	X		X
559GW04D03	27779.05	Water	X	X		X
563GW00203	27754.01	Water	X			X
563GW00303	27754.02	Water	X			X
GDEGW02303	27754.05	Water	X	X	X	X
GDEGW02303RE	27754.05RE	Water		+		
GDEGW23D03	27754.06	Water	X	X	X	X
559TW03D03	27779.08	Water	X			
GDETW23D03	27754.07	Water	X			
559GW03D03MS	27779.07MS	Water		+		
559GW03D03MSD	27779.07MSD	Water		+		
GDEGW23D03MS	27754.06MS	Water		+	+	
GDEGW23D03MSD	27754.06MSD	Water		+	+	

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
549GW00103	27779.01	Water		X	X	X
549GW00203	27779.02	Water		X	X	X
549GW00303	27779.03	Water		X	X	X
559GW00103	27754.03	Water		X	X	X
559GW00303	27779.06	Water		X	X	X
559GW00403	27779.04	Water		X	X	X
559GW00503	27754.04	Water		X	X	X
559GW03D03*	27779.07	Water		X	X	X
559GW04D03	27779.05	Water		X	X	X
563GW00203	27754.01	Water		X	X	X
563GW00303	27754.02	Water		X	X	X
GDEGW02303	27754.05	Water	X	X	X	X
GDEGW23D03	27754.06	Water	X	X	X	X

* = Duplicate sample was analyzed in SDG 27754B.

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: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27754A Appendix IX Organics and Inorganics

SAMPLE: 559HW03D03

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 11/01/96 on instrument R for the following compounds:

acrolein	0.021
isobutyl alcohol	0.006
1,4-dioxane	0.002

The results for these compounds in associated sample 559HW03D03 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 11/01/96 on instrument R exceeded the 30% QC limit for the following compounds:

bromomethane	30.2%
chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%
dichlorodifluoromethane	38.7%

There were no positive results for these compounds in the associated sample, so no action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) for the standards analyzed on 12/02/96 at 11:18 on instrument R were below the 0.005 QC limit for the following compounds:

2-chloroethyl vinyl ether	0.049
acrolein	0.037
acetonitrile	0.026
isobutyl alcohol	0.007
1,4-dioxane	0.002

The non-detect results for 2-chloroethyl vinyl ether and acetonitrile in associated sample 559HW03D03 were rejected (R). The non-detect results for the other two compounds in this sample were previously rejected based on low RRF's in the initial calibration.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/02/96 at 11:18 on instrument R for the following compounds:

acetone	66.0%
2-chloroethyl vinyl ether	46.2%
vinyl acetate	32.6%
1,1,2,2-tetrachloroethane	25.4%
chloroprene	34.7%
trans-1,4-dichloro-2-butene	38.8%
pentachloroethane	35.7%
dichlorodifluoromethane	55.8%
1,2-dibromo-3-chloropropane	31.3%

The non-detect result for 2-chloroethyl vinyl ether in the associated sample was previously rejected because of a low RRF in the initial calibration. The results for the other compounds in associated sample 559HW03D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride and carbon disulfide were detected at 2 ug/L and 1 ug/L, respectively, in method blank VBLK1. The positive results for these compounds in associated sample 559HW03D03, which were less than 10X the blank amount for methylene chloride and less than 5X for carbon disulfide, were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL.

Trip Blanks:

There were no positive detections in the trip blanks (analyzed in SDG 27754B) in this SDG. No action was required.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

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.) Laboratory Control Samples (LCS):

One LCS was analyzed for 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 taken.

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):

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 acrolein, 2-chloroethyl vinyl ether, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample 559HW03D03 based on 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:

The Average Relative Response Factor (RRF) was below the 0.050 QC limit for the standards analyzed on 12/10/96 on instrument A for aramite (0.048). The non-detect result for this compound in associated sample 559HW03D03 was rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/10/96 on instrument A for the following compounds:

methyl methanesulfonate	38.5%
n-nitrosomethylethylamine	30.3%
n-nitrosodiethylamine	31.8%
ethyl methanesulfonate	34.3%
2-picoline	40.8%
2,2'-oxybis(1-chloropropane)	33.7%
acetophenone	35.3%
n-nitrosopyrrolidine	34.6%
p-phenylenediamine	30.2%
m-cresol	32.7%
n-nitrosomorpholine	37.5%
o-toluidine	35.7%
n-nitroso-piperidine	33.7%
o,o,o-triethyl phosphorothionate	32.8%
n-nitroso-di-n-butylamine	36.2%
safrole	33.4%
isosafrole	36.3%
1,4-naphthoquinone	40.3%
1,3-dinitrobenzene	32.0%
1-naphthylamine	38.0%
4-nitroquinoline-1-oxide	46.9%
2-naphthylamine	36.1%
thionazin	34.6%
pentachlorobenzene	34.3%
diphenylamine	33.7%
sulfotepp	37.2%
1,3,5-trinitrobenzene	33.7%
phenacetin	35.0%
diallate	30.6%
dimethoate	34.3%
4-aminobiphenyl	39.8%
pronamide	39.2%
pentachloronitrobenzene	34.2%

disulfoton	32.9%
methyl parathion	33.2%
parathion	35.7%
methapyrilene	44.9%
isodrin	36.1%
chlorobenzilate	36.1%
3,3'-dimethylbenzidine	43.4%
kepone	43.9%
famphur	65.0%
7,12-dimethylbenz(a)anthracene	34.8%

There were no positive results for these compounds in the associated sample. No action was required.

Continuing Calibration:

The Relative Response Factors (RRF) for aramite (0.044) and hexachlorophene (0.028) in the standards analyzed on 12/10/96 at 08:35 on instrument A were below the 0.050 QC limit. The result for aramite in associated sample 559HW03D03 was previously rejected because of a low RRF in the initial calibration. The non-detect result for hexachlorophene in this sample was rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/10/96 at 08:35 on instrument A for the following compounds:

methyl methanesulfonate	66.6%
n-nitrsodimethylamine	30.4%
n-nitrosodiethylamine	31.6%
ethyl methanesulfonate	62.5%
acetophenone	39.4%
2-picoline	59.1%
o-toluidine	52.5%
o,o,o-triethyl phosphorothionate	36.5%
p-phenylenediamine	49.0%
safrole	42.7%
isosafrole	35.4%
1,3-dinitrobenzene	37.4%
1-naphthylamine	28.9%
4-nitroquinoline-1-oxide	49.0%
2-naphthylamine	38.2%
thionazin	36.0%
diphenylamine	63.6%
phorate	61.6%
diallate	35.8%
dimethoate	31.7%
4-aminobiphenyl	35.1%
pentachloronitrobenzene	37.4%
disulfoton	37.3%
methyl parathion	26.7%
isodrin	42.4%

famphur	38.7%
a,a-dimethylphenethylamine	31.0%
hexachlorophene	31.9%

The result for hexachlorophene in associated sample 559HW03D03 was previously rejected because of a low RRF in this calibration. The results for the other compounds in the associated 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 required.

TIC's:

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS criteria were not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG, so no action was required.

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 aramite and hexachlorophene were rejected in sample 559HW03D03 based on 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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	2.22 ug/L	11.1 ug/L
ICB	copper	1.20 ug/L	6.00 ug/L
CCB3	potassium	57.9 ug/L	290 ug/L
CCB4	thallium	2.80 ug/L	14.0 ug/L
PBW	tin	3.00 ug/L	15.0 ug/L
PBW	zinc	7.00 ug/L	35.0 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 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	iron	-39.8 ug/L	199 ug/L
PBW	lead	-2.21 ug/L	11.0 ug/L
PBW	selenium	-4.65 ug/L	23.2 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 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	6 ug/L
cadmium	1 ug/L
nickel	2 ug/L
thallium	8 ug/L
tin	5 ug/L

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

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

antimony	6 ug/L
barium	1 ug/L
copper	1 ug/L
manganese	1 ug/L
potassium	136 ug/L
vanadium	2 ug/L

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

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed for this SDG. No action was required.

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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, 559HW03D03 / 559GW03D03 (analyzed in SDG 27754B), was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	559GHW03D03, ug/L	559HW03D03, ug/L	RPD
aluminum	19.6	19.4	1.0%
arsenic	3.7	3.5	5.5%
barium	31	31.4	1.3%
calcium	76000	76800	1.0%
iron	337	328	2.7%
magnesium	17400	17500	0.6%
manganese	134	135	0.7%
potassium	6930	7010	1.1%
sodium	123000	122000	0.8%

None of the RPD's exceeded 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 required.

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.

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 in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides in field duplicate samples 559GW03D03 (analyzed in SDG 27754B) and 559HW03D03 was 1.8%, which 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.

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:

There were no positive detections of sulfates 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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates in field duplicate samples 559GW03D03 and 559HW03D03 was not calculable. 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 in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS in field duplicate samples 559GW03D03 (analyzed in SDG 27754B) and 559HW03D03 was 21.8%, which 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 Laboratories of Oklahoma, Inc. - 27754B CLP Organics and Inorganics

SAMPLES: 549GW00103, 549GW00203, 549GW00303, 559GW00103, 559GW00303, 559GW00403, 559GW00503, 559GW03D03, 559GW04D03, 563GW00203, 563GW00303, GDEGW02303, GDEGW02303RE, GDEGW23D03, 559TW03D03, GDETW23D03, 559GW03D03MS, 559GW03D03MSD, GDEGW23D03MS, GDEGW23D03MSD

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) of acetone was 39.3% for the standards analyzed on 10/11/96 on instrument K, which exceeded the 30% QC limit. There were no positive results for this compound in the associated samples, so no action was required.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 11/01/96 on instrument R for the following compounds:

bromomethane	30.2%
chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%

There were no positive results for these compounds in the associated samples, so no action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 11/27/96 at 05:06 on instrument K for the following compounds:

2-chloroethyl vinyl ether	74.3%
chloromethane	30.5%
acetone	46.7%

The results for these compounds in associated sample 563GW00203, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.049 for the standards analyzed on 12/02/96 at 11:18 on instrument R, which was below the 0.050 QC limit. The results for this compound in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were 563GW00303, 559GW00103, 559GW00503, GDEGW02303, GDEGW23D03, 549GW00103, 549GW00203 and 549GW00303.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/02/96 at 11:18 on instrument R for the following compounds:

2-chloroethyl vinyl ether	46.2%
acetone	66.0%
vinyl acetate	32.6%
1,1,2,2-tetrachloroethane	25.4%

The results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. All positive and non-detect results for acetone in the associated samples were flagged as estimated (J) and (UJ). The results for the other compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 563GW00303, 559GW00103, 559GW00503, GDEGW02303, GDEGW23D03, 549GW00103, 549GW00203 and 549GW00303.

The Relative Response Factor (RRF) for 2-chloroethyl vinyl ether was 0.036 for the standards analyzed on 12/03/96 at 09:52 on instrument R, which was below the 0.050 QC limit. The results for this compound in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were 559GW00403, 559GW04D03, 559GW00303 and 559GW03D03.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/03/96 at 09:52 on instrument R for the following compounds:

2-chloroethyl vinyl ether	60.4%
chloroethane	29.3%
acetone	34.0%
vinyl acetate	67.8%
trans-1,3-dichloropropene	27.2%

The results for 2-chloroethyl vinyl ether in the associated samples were previously rejected. The results for the other compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 559GW00403, 559GW04D03, 559GW00303 and 559GW03D03.

IV.) Blanks:

Method Blanks:

Methylene chloride and carbon disulfide were detected at 2 ug/L and 1 ug/L, respectively, in method blank VBLK2. All positive results for these compounds in the associated samples, less than 10X the blank amount for methylene chloride and 5X for carbon disulfide, were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL. The associated samples were 549GW00103, 549GW00203, 549GW00303, 559GW00103, 559GW00503, 563GW00303, GDEGW02303 and GDEGW23D03.

Trip Blanks:

Tetrachloroethane was detected at 2 ug/L in trip blank GDETW023D03. There were no positive results for this compound in the associated samples, so no action was required.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for 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 taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG, so no action was required.

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 in samples 563GW00303, 559GW00103, 559GW00503, GDEGW02303, GDEGW23D03, 549GW00103, 549GW00203 and 549GW00303, 559GW00403, 559GW04D03, 559GW00303 and 559GW03D03 were rejected based on low RRF's in the 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 required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 12/03/96 on instrument J exceeded the 30% QC limit for the following compounds:

naphthalene	35.9%
acenaphthylene	31.0%
di-n-butylphthalate	37.5%

No action was required since these compounds were not detected in the associated samples.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/05/96 at 08:40 on instrument A for the following compounds:

2,4-dinitrophenol	45.9%
2-methyl-4,6-dinitrophenol	29.2%
4-nitroaniline	29.4%

The results for these compounds in associated samples 559GW00103, 559GW00503, GDEGW02303 and GDEGW23D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks in this SDG. No action was required.

TIC's:

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) was below the 21-100% QC limits for 2-fluorophenol in sample GDEGW02303 (2%). Since the Percent Recovery was less than 10%, all results for the acid compounds in this sample, which consisted entirely of non-detects, were rejected (R).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) were outside their respective QC limits for spiked samples 559GW03D03MS and 559GW03D03MSD for the following compounds:

Compound	MS, %R	MSD, %R	QC Limits
4-nitrophenol	100	100	10-80%

Since this compound was not detected in unspiked sample 559GW03D3, no action was required.

The Relative Percent Difference (RPD) for n-nitroso-di-n-propylamine was 39% for spiked samples GDEGW23D3MS and GDEGW23D3MSD, which exceeded the 38% QC limit. The non-detect result for this compound in associated unspiked sample GDEGW23D03 was flagged as estimated (UJ).

The Percent Recovery (%R) of 4-nitrophenol was 85% for spiked sample GDEGW23D03MS, which exceeded the 10-80% QC limits. Since this compound was not detected in the associated unspiked sample, no action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. Several Percent Recoveries were outside their QC limits. Data validation action based on LCS criteria were not required. No action was taken.

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 required.

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 original analysis of sample GDEGW02303 was considered by the validator to be of preferable data quality to the reanalysis based on better holding time and internal standards performance.

All non-detect results for the acid compounds in sample GDEGW02303 were rejected (R) because of an extremely low (less than 10%) surrogate recovery. 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 Recovery (%R) of methoxychlor was 26.0% for the PEM standards analyzed on 12/03/96 at 15:10 on the primary column, which exceeded the 25% QC limit. The non-detect results for this compound in associated samples GDEGW02303 and GDEGW23D03 were flagged as estimated (UJ).

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 12/03/96 at 22:44 on the primary column for the following compounds:

4,4'-DDT	31.8%
methoxychlor	30.6%

The results for methoxychlor in the associated samples were previously flagged based on the PEM standard. The results for 4,4'-DDT in associated samples GDEGW02303 and GDEGW23D03, which were both non-detects, were flagged as estimated (UJ).

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 required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Differences (RPD's) for spiked samples GDEGW23D03MS and GDEGW23D03MSD exceeded the QC limits for the following compounds:

Compound	RPD	QC Limit
aldrin	27%	22%
heptachlor epoxide	46%	20%
dieldrin	50%	18%
gamma chlordane	58%	20%

The non-detect results for these compounds in associated unspiked sample GDEGW23D03 were flagged as estimated (UJ).

The Percent Recoveries (%R's) of spiked samples GDEGW23D03MS and GDEGW23D03MSD were below their QC limits for the following compounds:

Compound	MS, %R	MSD, %R	QC Limits
heptachlor	0	0	39-128%
aldrin	13	17	38-123%
heptachlor epoxide	35		39-124%
4,4'-DDE	42	48	70-122%

Compound	MS, %R	MSD, %R	QC Limits
dieldrin	34		40-123%
gamma-chlordane	23		40-137%

The non-detect results for aldrin, heptachlor epoxide, dieldrin and gamma-chlordane were previously flagged based on RPD exceedances for this MS / MSD. The non-detect result for 4,4'-DDE in unspiked sample GDEGW23D03 was flagged as estimated (UJ). The non-detect result for heptachlor in this sample was rejected (R) due to zero percent recoveries.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction in the SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

X.) Overall Assessment of Data/General:

The non-detect result for heptachlor in sample GDEGW23D03 was rejected due to zero percent matrix spike 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. No action was required.

III.) Blanks:

The following blank results represent the highest detections associated with the samples and were used

for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	2.22 ug/L	11.1 ug/L
ICB	copper	1.20 ug/L	6.00 ug/L
CCB3	potassium	57.9 ug/L	290 ug/L
CCB4	thallium	2.80 ug/L	14.0 ug/L
PBW	tin	3.00 ug/L	15.0 ug/L
PBW	zinc	7.00 ug/L	35.0 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 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:

Blank ID	Analyte	Neg. Conc.	5X Conc.
CCB3	iron	-39.8 ug/L	199 ug/L
PBW	lead	-2.21 ug/L	11.0 ug/L
PBW	selenium	-4.65 ug/L	23.2 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 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	6 ug/L
cadmium	1 ug/L
nickel	2 ug/L
thallium	8 ug/L
tin	5 ug/L

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

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

antimony	-6 ug/L
barium	-1 ug/L
copper	-1 ug/L
manganese	-1 ug/L
potassium	-136 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

The Percent Difference (%D) for manganese was 14.2%, which exceeded the 10% QC limit. All positive results for this analyte in the associated 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, 559HW03D03 (analyzed in SDG 27754A) and 559GW03D03, was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	559GHW03D03, ug/L	559HW03D03, ug/L	RPD
aluminum	19.6	19.4	1.0 %
arsenic	3.7	3.5	5.5 %
barium	31	31.4	1.3 %
calcium	76000	76800	1.0 %
iron	337	328	2.7 %
magnesium	17400	17500	0.6 %
manganese	134	135	0.7 %
potassium	6930	7010	1.1 %
sodium	123000	122000	0.8 %

None of the RPD's exceeded 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 required.

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.

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:

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):

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 chlorides in field duplicate samples 559GW03D03 and 559HW03D03 (analyzed in SDG 27754A) was 1.8%, which 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.

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:

There were no positive detections of sulfates 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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates in field duplicate samples 559GW03D03 and 559HW03D03 (analyzed in SDG 27754A) was not calculable. 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 in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS in field duplicate samples 559GW03D03 and 559HW03D03 (analyzed in SDG 27754A) was 21.8%, which 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.

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:	0176
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVEL:	EPA Level III
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chloride, Sulfate, Total Dissolved Solids (TDS)
SDG NUMBER:	27786 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
025GW00103	27811.01	Water	X		X	X
025GW00203	27811.02	Water	X		X	X
025GW00303	27811.03	Water	X		X	X
025GW00403	27811.04	Water	X		X	X
526GW00103	27786.01	Water				X
526GW00203	27786.03	Water				X
526GW01D03	27786.02	Water				X
528GW00103	27786.04	Water				X
551GW00103	27786.06	Water				X
551GW00203	27786.05	Water				X
GDEGW02403	27811.06	Water	X	X	X	X
GDEGW02403RE	27811.06RE	Water		+		
GDEGW24D03	27811.05	Water	X	X	X	X
GDEGW24D03RE	27811.05RE	Water		+		
551DW00103	27786.07	Water	X	X		X
551EW00103	27786.08	Water	X	X		X
551FW00103	27786.09	Water	X	X		X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total metals
551TW00103	27786.10	Water	X			
GDETW02403	27811.07	Water	X			
551DW00103MS	27786.07MS	Water	+			
551DW00103MSD	27786.07MSD	Water	+			

DW = DEIONIZED RINSATE BLANK, EW = EQUIPMENT RINSATE BLANK,
FW = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
RE = REANALYSIS, TW = TRIP BLANK

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
025GW00103	27811.01	Water		X	X	X
025GW00203	27811.02	Water		X	X	X
025GW00303	27811.03	Water		X	X	X
025GW00403	27811.04	Water		X	X	X
526GW00103	27786.01	Water		X	X	X
526GW00203	27786.03	Water		X	X	X
526GW01D03	27786.02	Water		X	X	X
528GW00103	27786.04	Water		X	X	X
551GW00103	27786.06	Water		X	X	X
551GW00203	27786.05	Water		X	X	X
GDEGW02403	27811.06	Water	X	X	X	X
GDEGW24D03	27811.05	Water	X	X	X	X
551DW00103	27786.07	Water		X	X	X
551EW00103	27786.08	Water		X	X	X
551FW00103	27786.09	Water		X	X	X

DW = DEIONIZED RINSATE BLANK, EW = EQUIPMENT RINSATE BLANK,
FW = FIELD RINSATE BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27786 CLP Organics and Inorganics

SAMPLES: 025GW00103, 025GW00203, 025GW00303, 025GW00403, 526GW00103, 526GW01D03, 526GW00203, 528GW00103, 551GW00103, 551GW00203, GDEGW02403, GDEGW02403RE, GDEGW24D03, GDEGW24D03RE, 551DW00103, 551EW00103, 551FW00103, 551TW00103, GDETW02403, 551DW00103MS, 551DW00103MSD

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 11/01/96 on instrument R for the following compounds:

bromomethane	30.2%
chloroethane	30.6%
vinyl acetate	50.5%
2-chloroethyl vinyl ether	54.0%

Since the associated samples were field and trip blanks, no action was required.

The Percent Relative Standard Deviation (%RSD) exceeded the 30% QC limit for acetone (32.8%) in the standards analyzed on 12/06/96 on instrument R. After blank qualification, there were no positive results for this compound in the associated samples. No action was required.

Continuing Calibration:

The Relative Response Factor (RRF) of 2-chloroethyl vinyl ether was 0.036 for the standards analyzed on 12/03/96 at 09:52 on instrument R, which was below the 0.050 QC limit. The results for this compound in associated 551DW00103, 551EW00103, 551FW00103, and 551TW00103 and GDETW02403 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/03/96 at 09:52 on instrument R for the following compounds:

2-chloroethyl vinyl ether	27.2%
chloroethane	29.3%
acetone	34.0%
vinyl acetate	67.8%
trans-1,3-dichloropropene	27.2%

The results for 2-chloroethyl vinyl ether in the associated blanks were previously rejected. No further action was required, since the associated samples were field and trip blanks.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/09/96 at 10:10 on instrument R for methylene chloride (36.5%) and chloroethane (31.1%). The results for these compounds in samples 025GW00403, 025GW00103, 025GW00203, 025GW00303, GDEGW02403 and GDEGW24D03, which consisted entirely of non-detects after blank qualification, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Methylene chloride was detected at 4 ug/L in method blank VBLK2. All positive results for this compound in the associated samples less than 10X the blank amount were flagged as undetected (U) with the results less than the CRQL being raised to the CRQL. The associated samples were 025GW00103, 025GW00203, 025GW00303, 025GW00403, GDEGW02403 and GDEGW24D03.

Methylene chloride and acetone were detected at 20 ug/L and 14 ug/L, respectively, in method blank VBLK3. Since the associated samples were trip blanks, no action was required.

Deionized Water Blank:

Chloroform was detected at 3 ug/L in deionized water blank 551DW00103. The positive result for this compound in associated sample 025GW00103, which was less than 5X the blank amount, was flagged as undetected (U) with the detection limit being raised to the level of contamination in the sample.

Equipment Rinsate Blank:

Acetone and chloroform were detected at 4 ug/L and 2 ug/L, respectively, in equipment rinsate blank 551EW00103. The positive results for acetone in associated samples 025GW00403, GDEGW02403 and GDEGW25D03, which were 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. The results for chloroform were previously qualified using the deionized water blank, so no further action was required.

Field Blank:

Chloroform was detected at 3 ug/L in field blank 551FW00103. The results for chloroform were previously flagged based on the deionized water blank, so no further action was required.

Trip Blanks:

Methylene chloride and acetone were detected at 23 ug/L and 8 ug/L, respectively, in trip blank GDETW02403. The results for these compounds were previously qualified based on the method and equipment rinsate blanks. No further action was required.

TIC's:

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples identified in this SDG, so no action was required.

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 in field and trip blanks 551DW00103, 551EW00103, 551FW00103, 551TW00103 and GDETW02403 were rejected based on a low RRF in the associated 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 required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 12/09/96 on instrument V exceeded the 30% QC limit for the following compounds:

1,2-dichlorobenzene	30.2%
4-methylphenol	35.7%
naphthalene	41.9%
hexachloroethane	35.9%
hexachlorocyclopentadiene	40.1%

The positive result for naphthalene in associated sample GDEGW02403 was flagged as estimated (J). No further action was required since there were no other associated positive samples.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 2%% QC limit for the standards analyzed on 12/11/96 at 08:23 on instrument V for the following compounds:

1,2-dichlorobenzene	30.3%
4-methylphenol	31.6%
hexachloroethane	36.4%
naphthalene	32.7%
hexachlorocyclopentadiene	33.3%
acenapthylene	25.7%

The results for these compounds in associated samples GDEGW02403 and GDEGW24D03, 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.

Deionized Water Blank:

Bis(2-ethylhexyl)phthalate was detected at 36 ug/L in deionized water blank 551DW00103. The positive results for this compound in associated sample GDEGW24D03, which was less than 10X the blank amount, was flagged as undetected (U) with the detection limit being raised to the level of contamination in the sample.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) exceeded the 21-100% QC limits for 2-fluorophenol in sample 551DW00103 (16%). Since only one Surrogate Percent Recovery exceeded the QC limits for this sample in the acid fraction, no action was required.

The Percent Recoveries (%R's) of 2-fluorophenol (20%) and 2,4,6-tribromophenol (5%) were below their QC limits, 21-100% and 10-123%, respectively, for sample GDEGW02403. Since one %R was less than 10%, all acid compounds, in this sample, which consisted entirely of non-detects, were rejected (R).

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples identified in this SDG, so no action was required.

IX.) Internal Standards Performance (ISTD):

The ISTD Recoveries (%R's) of chrysene-d12 (47.7%) and perylene-d12 (33.0%) in sample GDEGW24D03 were below the 50-200% QC limits. All positive and non-detect results for the compounds quantitated on these standards were flagged as estimated (J) and (UJ).

The Percent Area Counts Recovery (%R) of perylene-d12 (46.2%) for sample GDEGW02403 was below the 50-200% QC limits. All positive and non-detect results for the compounds quantitated on this standard 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 GDEGW02403 was considered by the validator to be of preferable data quality to the reanalysis based on better holding times. The original analysis of sample GDEGW24D03 was considered by the validator to be of preferable data quality to the reanalysis based on better Internal Standards Performance.

All acid compounds in sample GDEGW02403 were rejected because of a low (less than 10%) surrogate recovery. 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 Recoveries (%R's) exceeded the 25% QC limit for the PEM standards analyzed on 12/10/96 at 10:42 for the following compounds:

Compound	Column 1 %R	Column 2 %R
beta-BHC	29.0	
4,4'-DDT		28.0
methoxychlor		34.0

The results for these compounds in associated samples 025GW00103, 025GW00203 and 025GW00303, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Recovery (%R) of methoxychlor was 29.6% for the PEM standards analyzed on 12/06/96 at 16:15 on the secondary column, which exceeded the 25% QC limit. All results for this compound in associated samples 025GW00403, GDEGW24D03 and GDEGW02403, 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 necessary.

Continuing Calibration:

The Percent Recoveries (%R's) exceeded the 25% QC limit for the standards analyzed on 12/10/96 at 20:52 on the primary column for the following compounds:

alpha-BHC	28.5%
beta-BHC	31.4%
gamma-BHC	26.0%
delta-BHC	26.2%
4,4'-DDD	46.1%
4,4'-DDT	36.9%

The results for these compounds in associated samples 025GW00403, GDEGW02403 and GDEGW24D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Recoveries (%R's) exceeded the 25% QC limit for the standards analyzed on 12/07/96 at 00:50 on the secondary column for the following compounds:

methoxychlor	31.8%
4,4'-DDT	25.5%

The results for these compounds in associated samples 025GW00103, 025GW00203 and 025GW00303, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Recoveries (%R's) exceeded the 25% QC limit for the standards analyzed on 12/10/96 at 11:43 on the secondary column for the following compounds:

4,4'-DDT	33.8%
methoxychlor	30.6%

The results for these compounds in associated samples 025GW00403, GDEGW02403 and GDEGW24D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Recoveries (%R's) exceeded the 25% QC limit for the standards analyzed on 12/10/96 at 20:22 on the secondary column for the following compounds:

4,4'-DDD	34.2%
4,4'-DDT	70.6%
methoxychlor	50.5%

The results for these compounds in associated samples 025GW00403, GDEGW02403 and GDEGW24D03, which consisted entirely of non-detects, were flagged as estimated (UJ).

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 required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no field duplicate samples identified in this SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

All criteria were met, so no action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

X.) 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. No action was required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
551DW00103	aluminum	22.9 ug/L	114 ug/L
CCB4	antimony	2.70 ug/L	13.5 ug/L
551EW00103	arsenic	3.10 ug/L	15.5 ug/L
551DW00103	beryllium	0.52 ug/L	2.60 ug/L
551EW00103	calcium	27.2 ug/L	136 ug/L
551DW00103	copper	1.80 ug/L	9.00 ug/L
551FW00103	nickel	3.20 ug/L	16.0 ug/L
CCB1	selenium	3.50 ug/L	17.5 ug/L
PBW	silver	2.21 ug/L	11.0 ug/L
PBW	thallium	2.99 ug/L	14.9 ug/L
551EW00103	zinc	9.20 ug/L	46.0 ug/L
CCB4	cyanide	2.40 ug/L	12.0 ug/L

CCB = Continuing Calibration Blank, PBW= Preparation Blank (Water),
DW = Deionized Water Blank, EW = Equipment Rinsate Blank,
FW = Field 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, preparation, deionized water, equipment rinsate or field blank were flagged as undetected (U).

A negative result was observed for vanadium (-0.70 ug/L) in continuing calibration blank CCB4. All associated positive sample results less than 5X the absolute value of the negative blank result 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	7 ug/L
beryllium	1 ug/L
cadmium	1 ug/L
copper	1 ug/L
nickel	3 ug/L
thallium	3 ug/L
tin	3 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
lead	-2 ug/L
manganese	-1 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

All ICP 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:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

There were no field duplicate samples identified in this SDG. 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 required.

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.

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, Equipment Rinsate and Field Blanks:

Chlorides were not detected in the three field blanks analyzed 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):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples identified in this SDG. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks analyzed 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):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples identified in this SDG. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without 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:

There were no positive detections in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

TDS was not detected in the deionized water and equipment rinsate blanks analyzed in this SDG. No action was required.

Field Blank:

Total Dissolved Solids (TDS) were detected at 52 mg/L in field blank 551FW00103. All positive results for TDS in the associated samples, which were 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. The associated samples were 025GW00103, 025GW00203, 025GW00303, 025GW00404 and 528GW00103.

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:

There were no field duplicate samples identified in this SDG. No action was required.

VII.) Overall Assessment of Data/General:

TDS was detected in the field blank at a level greater than the MDL.

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:	0177
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Levels III / Level IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Organotin, Total Metals, Cyanide, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27827 (Level IV) 27827 (Level III)

SAMPLES:

SDG 27827A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides PCB's	Total Metals
GDEHW00503*	27828.02	Water	X	X	X	X
GDEHW02503*	27828.01	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEHW00503*	27828.02	Water	X	X	X	X
GDEHW02503*	27828.01	Water	X	X	X	X

* = Corresponding samples GDEGW00503 and GDEGW02503 were analyzed in SDG 27827B.

HW = FIELD DUPLICATE

SDG 27827B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
021GW00203	27841.06	Water				X
021GW00303	27841.05	Water				X
067GW00103	27841.01	Water				X
067GW00203	27827.01	Water				X
070GW00103	27827.02	Water	X			X
070GW00203	27827.04	Water	X			X
070GW01D03	27827.03	Water	X			X
542GW00103	27841.02	Water				X
542GW00203	27841.03	Water				X
542GW00303	27841.04	Water				X
550GW00103	27841.07	Water				X
GDEGW00503	27827.09	Water	X	X	X	X
GDEGW02503	27827.05	Water	X	X	X	X
GDEGW02503RE	27827.05RE	Water		+		
GDEGW25D03	27827.06	Water	X	X	X	X
GDEGW25D03RE	27827.06RE	Water		+		
550DW00103	27841.10	Water	X	X	X	X
550EW00103	27841.11	Water	X	X	X	X
550FW00103	27841.12	Water	X	X	X	X
550TW00103	27841.13	Water	X			
GDETW00503	27827.10	Water	X			
GDEGW25D03MS	27827.07MS	Water	+	+	+	+
GDEGW25D03MSD	27827.08MSD	Water	+	+	+	+
550GW00103MS	27841.08MS	Water				+
550GW00103MSD	27841.09MSD	Water				+

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
021GW00203	27841.06	Water		X	X	X
021GW00303	27841.05	Water		X	X	X
067GW00103	27841.01	Water		X	X	X
067GW00203	27827.01	Water		X	X	X
070GW00103	27827.02	Water		X	X	X
070GW00203	27827.04	Water		X	X	X
070GW01D03	27827.03	Water		X	X	X
542GW00103	27841.02	Water		X	X	X
542GW00203	27841.03	Water		X	X	X
542GW00303	27841.04	Water		X	X	X
550GW00103	27841.07	Water		X	X	X
GDEGW00503	27827.09	Water	X	X	X	X
GDEGW02503	27827.05	Water	X	X	X	X
GDEGW25D03	27827.06	Water	X	X	X	X
550DW00103	27841.10	Water	X	X	X	X
550EW00103	27841.11	Water	X	X	X	X
550FW00103	27841.12	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEGW25D03MS	27827.07MS	Water	+			
GDEGW25D03MSD	27827.08MSD	Water	+			
550GW00103MS	27841.08MS	Water		+	+	
550GW00103MSD	27841.09MSD	Water		+	+	
067GW00103MD	27841.01DUP	Water				+

+ = Non-billable analysis
* = Corresponding duplicate samples GDEHW00503 and GDEHW02503 were analyzed in SDG 27827A.

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, MD = MATRIX DUPLICATE, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, TW = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27827A Appendix IX CLP Inorganics

SAMPLES: GDEHW00503, GDEHW02503

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 12/6/96 on instrument R for the following compounds:

acrolein	0.038
acetonitrile	0.027
isobutyl alcohol	0.009
1,4-dioxane	0.003

All results for these compounds in samples GDEHW00503 and GDEHW02503, 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 12/6/96 on instrument R for the following compounds:

acetone	32.8%
1,4-dioxane	34.6%
dichlorodifluoromethane	35.0%

The non-detect results for 1,4-dioxane were previously rejected because of a low RRF in this calibration. There were no positive results for the other two compounds in the associated samples. No further action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standard analyzed on 12/11/96 at 10:56 on instrument R for the following compounds:

acrolein	0.039
acetonitrile	0.029
isobutyl alcohol	0.008
1,4-dioxane	0.002

The non-detect results for these compounds in samples GDEHW00503 and GDEHW02503 were previously rejected based on low RRF's in the initial calibration. No further action was necessary.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/11/96 at 10:56 on instrument R for the following compounds:

chloromethane	25.6%
1,4-dioxane	33.3%
dichlorodifluoromethane	65.3%

The non-detect results for 1,4-dioxane were previously rejected because of a low RRF in the initial calibration. The non-detect results for the other two compounds in samples GDEHW00503 and GDEHW02503 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:

Acetone (12 ug/L) and methylene chloride (6 ug/L) were detected in deionized water blank 550DW00103, which was analyzed in SDG 27827B. There were no positive detections of these compounds in the associated samples. No action was necessary.

Equipment Rinsate Blank:

Acetone (10 ug/L), methylene chloride (7 ug/L) and chloroform (2 ug/L) were detected in equipment rinsate blank 550EW00103, which was analyzed in SDG 27827B. There were no positive detections of these compounds in the associated samples. No action was required.

Field Blank:

Chloroform (2 ug/L) was detected in field blank 550FW00103, which was analyzed in SDG 27827B. This compound was not detected in the associated samples. No action was necessary.

Trip Blank:

Acetone (7 ug/L) and methylene chloride (18 ug/L) were detected in trip blank GDETW00503, which was analyzed in SDG 27827B. There were no positive detections of these compounds in the associated samples. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two field duplicate samples in this SDG. No action was required.

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 acrolein, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in both SDG 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. 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 hexachlorophene was 0.041 for the standards analyzed on 12/19/96 on instrument A, which was below the 0.050 QC limit. The non-detect results for this compound in samples GDEHW00503 and GDEHW02503 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/19/96 on instrument A for the following compounds:

methyl methanesulfonate	36.5%
ethyl methanesulfonate	36.3%
acetophenone	35.2%
m-cresol	32.7%
n-nitrosomorpholine	31.4%
o-toluidine	38.4%
o,o,o-triethylphosphorothioate	34.0%
safrole	35.0%
isosafrole	33.3%
1,4-naphthoquinone	38.9%
1,3-dinitrobenzene	43.1%
1-naphthylene	43.0%
2-naphthylene	44.9%
4-nitroquinoline-1-oxide	47.0%
1,2,4,5-tetrachlorobenzene	36.1%
hexachloropropane	32.1%
thionazin	30.9%
diphenylamine	33.7%
sulfotep	37.2%
1,3,5-trinitrobenzene	33.7%
phorate	32.0%
phenacetin	35.2%
diallate	30.9%
dimethoate	38.2%
4-aminobiphenyl	42.7%
pronamide	37.5%
pentachloronitrobenzene	35.9%

disulfoton	35.8%
2-sec-butyl-4,6-dinitrophenol	41.9%
methyl parathion	39.7%
parathion	36.2%
methapyrilene	51.0%
chlorobenzilate	30.9%
3,3'-dimethylbenzidine	38.6%
kepone	43.9%
famphur	76.4%
acetamidofluorene	35.1%
7,12-dimethylbenz(a)anthracene	34.9%
2-picoline	42.8%

There were no positive detections of these compounds in the associated samples. No action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) for hexachlorophene and aramite were 0.022 and 0.046, respectively, for the standard analyzed on 12/19/96 at 10:31 on instrument A, which was below the 0.050 QC limit. The non-detect results for hexachlorophene were previously rejected because of a low RRF in the initial calibration. The non-detect results for aramite in samples GDEHW00503 and GDEHW02503 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/19/96 at 10:31 on instrument A for the following compounds:

n-nitrosodimethylamine	32.1%
methyl methanesulfonate	72.8%
ethyl methanesulfonate	53.4%
n-nitrosomethylethylamine	48.8%
n-nitrosodiethylamine	98.7%
2-picoline	76.0%
acetophenone	51.6%
n-nitrosopyrrolidine	32.2%
n-nitrosomorpholine	37.3%
o-toluidine	54.9%
1-nitrosopiperidine	31.6%
safrole	46.8%
isosafrole	38.6%
1,4-naphthoquinone	28.5%
1-naphthylamine	46.4%
2-naphthylamine	54.2%
phorate	29.4%
4-aminobiphenyl	46.1%
pronoamide	30.2%
pentachloronitrobenzene	61.8%
chlorobenzilate	31.4%
3,3'-dimethylbenzidine	53.5%

famphur	101%
m-cresol	58.0%
diphenylamine	60.4%
sulfotep	92.1%
kepone	32.3%
p-phenylenediamine	75.6%
hexachlorophene	46.6%

The non-detect results for hexachlorophene were previously rejected because of a low RRF in the initial calibration. All results for the other compounds in samples GDEHW00503 and GDEHW02503, 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, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 27827B. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. Several Percent Recoveries (%R's) were outside QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two field duplicate samples in this SDG. No action was required.

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 aramite and hexachlorophene were rejected in both SDG samples because of 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 Difference (%D) was 25.8% for endrin in the PEM3X standard analyzed on 12/10/96 at 19:23 on the secondary column, which exceeded the 25% QC limit. The non-detect result for endrin in sample GDEHW02503 was flagged as estimated (UJ).

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 taken.

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, which were analyzed in SDG 27827B. No 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 by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

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 calculable Relative Percent Differences (RPD's) for the two field duplicate samples in this 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):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with one 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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
DW	aluminum	22.3 ug/L	112 ug/L
DW	antimony	2.50 ug/L	12.5 ug/L
FW	calcium	30.0 ug/L	150 ug/L
DW	chromium	4.80 ug/L	24.0 ug/L
CCB1	copper	0.80 ug/L	4.00 ug/L
PBW	lead	2.17 ug/L	10.1 ug/L
DW	nickel	2.40 ug/L	12.0 ug/L
PBW	tin	16.1 ug/L	80.5 ug/L
FW	cyanide	4.50 ug/L	22.5 ug/L

CCB = Continuing Calibration Blank, PBW= Preparation Blank (Water), DW = Deionized Water Blank 550DW00103 (analyzed in SDG 27827B), FW = Field Blank 550FW00103 (analyzed in SDG 27827B)

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 or field 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.
CCB5	copper	-0.80 ug/L	4.00 ug/L
PBW	thallium	-4.45 ug/L	22.3 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 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	5 ug/L
chromium	1 ug/L
nickel	3 ug/L
thallium	4 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
copper	-1 ug/L
selenium	-3 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

ICP Serial Dilution Analysis was not performed in this fraction of the 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Two set of field duplicate samples, GDEHW00503 / GDEGW00503 (analyzed in SDG 27827B) and GDEHW02503 / GDEGW02503 (analyzed in SDG 27827B), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEHW00503	GDEGW00503	RPD
aluminum	336 ug/L	418 ug/L	21.8%
calcium	135000 ug/L	139000 ug/L	2.9%
iron	4000 ug/L	4200 ug/L	4.9%
magnesium	283000 ug/L	295000 ug/L	4.2%
manganese	429 ug/L	445 ug/L	3.7%
potassium	94400 ug/L	97500 ug/L	3.2%
sodium	2670000 ug/L	2820000 ug/L	5.5%

Analyte	GDEHW02503	GDEGW02503	RPD
calcium	109000 ug/L	105000 ug/L	3.7%
iron	2120 ug/L	2140 ug/L	0.9%
magnesium	13300 ug/L	12900 ug/L	3.1%
manganese	151 ug/L	147 ug/L	2.7%
potassium	9690 ug/L	9090 ug/L	6.4%
sodium	22700 ug/L	21500 ug/L	5.4%

None of the RPD's exceeded 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.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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.

Deionized Water and Equipment Rinsate Blanks:

Chlorides were not detected in the deionized water or equipment rinsate blanks, which were analyzed in SDG 27639B. No action was required.

Field Blank:

Chlorides were detected at 0.7 mg/L in field blank 550FW00103, which was analyzed in SDG 27827B. The positive detections of chlorides in the two SDG samples were greater than 5X the blank amount. 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Sample GDEHW00503 was analyzed in this SDG while corresponding sample GDEGW00503 was analyzed in SDG 27827B. The Relative Percent Difference (RPD) for chlorides was 0.6%, which was within the 30% QC limit for water samples. No action was taken.

Sample GDEHW02503 was analyzed in this SDG while corresponding sample GDEGW02503 was analyzed in SDG 27827B. The Relative Percent Difference (RPD) for chlorides was 61.4%, which exceeded the 30% QC limit for water samples. The positive results for chlorides in these two samples were flagged as estimated (J).

VII.) 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. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 27827B. 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

Sample GDEHW00503 was analyzed in this SDG while corresponding sample GDEGW00503 was analyzed in SDG 27827B. The Relative Percent Difference (RPD) for sulfates was 5.9%, which was within the 30% QC limit for water samples. No action was taken.

Sample GDEHW02503 was analyzed in this SDG while corresponding sample GDEGW02503 was analyzed in SDG 27827B. The Relative Percent Difference (RPD) for sulfates was 0.5%, which was within the 30% QC limit for water samples. No action was taken.

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 Blank:

TDS was not detected in the method blank. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field blanks, which was analyzed in SDG 27827B. 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:

Sample GDEHW00503 was analyzed in this SDG while corresponding sample GDEGW00503 was analyzed in SDG 27827B. The Relative Percent Difference (RPD) for TDS was 8.1%, which was within the 30% QC limit for water samples. No action was taken.

Sample GDEHW02503 was analyzed in this SDG while corresponding sample GDEGW02503 was analyzed in SDG 27827B. The Relative Percent Difference (RPD) for TDS was 8.4%, which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27827B CLP Organics and Inorganics

SAMPLES: 021GW00203, 021GW00303, 067GW00103, 067GW00203, 070GW00103, 070GW00203, 070GW01D03, 542GW00103, 0542GW00203, 542GW00303, 550GW00103, GDEGW00503, GDEGW02503, GDEGW02503RE, GDEGW25D03, GDEGW25D03RE, 550DW00103, 550EW00103, GDEFW00103, 550TW00103, GDETW00503, GDEGW25D03MS, GDEGW25D03MSD, 550GW00103MS, 550GW00103MSD, 067GW00103MD

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) for acetone was 32.8% for the standards analyzed on 12/6/96 on instrument R, which exceeded the 30% QC limit. There were no positive results for acetone in the associated samples after blank qualifications. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/10/96 at 13:49 on instrument R for the following compounds:

chloromethane	28.7%
methylene chloride	43.3%
acetone	25.7%

All results for these compounds in the associated samples, which consisted entirely of non-detects after blank qualifications, were flagged as estimated (UJ). The associated samples were 070GW00103, 070GW00203, 070GW01D03, GDEGW00503, GDEGW02503 and GDEGW25D03.

IV.) Blanks:

Method Blank:

Acetone (14 ug/L) and methylene chloride (20 ug/L) were detected in method blank VBLK1. Blank qualifications were performed using the equipment rinsate blank. No further action was necessary.

Deionized Water Blank:

Acetone (12 ug/L) and methylene chloride (6 ug/L) were detected in deionized water blank 550DW00103. Blank qualifications were performed using the equipment rinsate blank. No further action was necessary.

Equipment Rinsate Blank:

Acetone (10 ug/L), methylene chloride (7 ug/L) and chloroform (2 ug/L) were detected in equipment rinsate blank 550EW00103. All positive detections of acetone and methylene chloride less than 10X and chloroform less than 5X the blank amounts were flagged as undetected (U) with analytical results less than the CRQL being raised to the CRQL.

Field Blank:

Chloroform (2 ug/L) was detected in field blank 550FW00103. This compound was previously qualified based on the equipment rinsate blank. No further action was taken.

Trip Blank:

Acetone (7 ug/L) and methylene chloride (18 ug/L) were detected in trip blank GDETW00503. Blank qualifications were previously performed using the equipment rinsate blank. There were no positive detections in trip blank 550TW00503. No further action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met for the two sets of MS / MSD samples. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two field duplicate samples in this SDG. No action was required.

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 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) for hexachlorocyclopentadiene was 38.3%, which exceeded the 30% QC limit for the standards analyzed on 12/15/96 on instrument T. The only samples associated with this calibration were field blanks. No action was necessary.

The Percent Relative Standard Deviation (%RSD) for hexachlorocyclopentadiene was 37.6%, which exceeded the 30% QC limit for the standards analyzed on 12/19/96 on instrument V. This compound was not detected in associated sample GDEGW00503. No action was taken.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/11/97 at 08:23 on instrument V for the following compounds:

1,2-dichlorobenzene	30.3%
2,2'-oxybis(1-chloropropane)	30.2%
4-methylphenol	31.6%
hexachloroethane	36.4%
naphthalene	32.7%
hexachlorocyclopentadiene	33.3%
acenaphthylene	25.7%

All results for these compounds in associated samples GDEGW02503 and GDEGW25D03, 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, 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.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. Several Percent Recoveries were outside QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The Internal Standard Percent Recoveries (%R's) for perylene-d12 were 22.3% and 24.4%, respectively, for samples GDEGW02503 and GDEGW25D03, which were below the 50-200% QC

limits. All compounds quantitated on this ISTD in the two samples, which consisted entirely of non-detects, were rejected (R) because the %R's were below 25%. The reanalyses did not yield improved recoveries.

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 of samples GDEGW02503 and GDEGW25D03 were considered by the validator to be of preferable data quality compared to the reanalysis samples because of better ISTD %R's. All non-detect results for compounds quantitated on the perylene ISTD in samples GDEGW02503 and GDEGW25D03 were rejected because of very low ISTD %R's (less than 25%) in the two samples. 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 Difference (%D) was 25.8% for endrin in the PEM3X standard analyzed on 12/10/96 at 19:23 on the secondary column, which exceeded the 25% QC limit. The non-detect results for endrin in associated samples GDEGW00503, GDEGW02503 and GDEGW25D03 were flagged as estimated (UJ).

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 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. 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 by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met. No action was necessary.

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 calculable Relative Percent Differences (RPD's) for the two field duplicate samples in this 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):

GPC cleanup was not required in 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
DW	aluminum	22.3 ug/L	112 ug/L
DW	antimony	2.50 ug/L	12.5 ug/L
FW	calcium	30.0 ug/L	150 ug/L
DW	chromium	4.80 ug/L	24.0 ug/L
CCB1	copper	0.80 ug/L	4.00 ug/L
PBW	lead	2.17 ug/L	10.1 ug/L
DW	nickel	2.40 ug/L	12.0 ug/L
PBW	tin	16.1 ug/L	80.5 ug/L
FW	cyanide	4.50 ug/L	22.5 ug/L

CCB = Continuing Calibration Blank, DW = Deionized Water Blank (550DW00103), FW = Field Blank (550FW00103), 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 or field 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.
CCB5	copper	-0.80 ug/L	4.00 ug/L
PBW	thallium	-4.45 ug/L	22.3 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 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	5 ug/L
chromium	1 ug/L
nickel	3 ug/L
thallium	4 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
copper	-1 ug/L
selenium	-3 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) of thallium was 72.0% for water spiked sample GDEGW25D03, which was below the 75-125% QC limits. All positive and non-detect results for thallium in the SDG samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Two set of field duplicate samples, GDEGW00503 / GDEHW00503 (analyzed in SDG 27827A) and GDEGW02503 / GDEHW02503 (analyzed in SDG 27827A), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEHW00503	GDEGW00503	RPD
aluminum	336 ug/L	418 ug/L	21.8%
calcium	135000 ug/L	139000 ug/L	2.9%
iron	4000 ug/L	4200 ug/L	4.9%
magnesium	283000 ug/L	295000 ug/L	4.2%
manganese	429 ug/L	445 ug/L	3.7%
potassium	94400 ug/L	97500 ug/L	3.2%
sodium	2670000 ug/L	2820000 ug/L	5.5%

Analyte	GDEHW02503	GDEGW02503	RPD
calcium	109000 ug/L	105000 ug/L	3.7%
iron	2120 ug/L	2140 ug/L	0.9%
magnesium	13300 ug/L	12900 ug/L	3.1%
manganese	151 ug/L	147 ug/L	2.7%
potassium	9690 ug/L	9090 ug/L	6.4%
sodium	22700 ug/L	21500 ug/L	5.4%

None of the RPD's exceeded 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 required.

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.

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.

Deionized Water and Equipment Rinsate Blanks:

Chlorides were not detected in these two field blanks. No action was required.

Field Blank:

Chlorides were detected at 0.7 mg/L in field blank 550FW00103. The positive detections of chlorides in samples 070GW00103 and 070GW00204, which were less than 5X the blank amount, were flagged as undetected (U) with the detection limit being raised to the amount 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):

The Percent Recovery (%R) of chlorides was 55% for water spiked sample 550GW00103MS, which was below the 75-125% QC limits. The positive result for chlorides in unspiked sample 550GW00103 was flagged as estimated (J).

VI.) Field Duplicates:

Sample GDEGW00503 was analyzed in this SDG while duplicate sample GDEHW00503 was analyzed in SDG 27827A. The Relative Percent Difference (RPD) for chlorides was 0.6%, which was within the 30% QC limit for water samples. No action was taken.

Sample GDEGW02503 was analyzed in this SDG while duplicate sample GDEHW02503 was analyzed in SDG 27827A. The Relative Percent Difference (RPD) for chlorides was 61.4%, which exceeded the 30% QC limit for water samples. The positive results for chlorides in the two samples were flagged as estimated (J).

VII.) 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. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were 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.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

All MS / MSD Recovery criteria were met. No action was required.

VI.) Field Duplicates:

Sample GDEGW00503 was analyzed in this SDG while duplicate sample GDEHW00503 was analyzed in SDG 27827A. The Relative Percent Difference (RPD) for sulfates was 5.9%, which was within the 30% QC limit for water samples. No action was taken.

Sample GDEGW02503 was analyzed in this SDG while duplicate sample GDEHW02503 was analyzed in SDG 27827A. The Relative Percent Difference (RPD) for sulfates was 0.5%, which was within the 30% QC limit for water samples. No action was taken.

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 Blank:

TDS was not detected in the method blank. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field blanks, which was analyzed in SDG 27827B. No action was required.

IV.) Laboratory Check Samples (LCS):

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

V.) Laboratory Duplicate Analysis:

All Relative Percent Difference (RPD) criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

Sample GDEGW00503 was analyzed in this SDG while duplicate sample GDEHW00503 was analyzed in SDG 27827A. The Relative Percent Difference (RPD) for TDS was 8.1%, which was within the 30% QC limit for water samples. No action was taken.

Sample GDEGW02503 was analyzed in this SDG while duplicate sample GDEHW02503 was analyzed in SDG 27827A. The Relative Percent Difference (RPD) for TDS was 8.4%, which was within the 30% QC limit for water samples. 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
SERVICE ORDER NUMBER:	0180
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27868 (Level IV) 27868 (Level III)

SAMPLES:

SDG 27868A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
065HW00403*	27913.01	Water	X		X	X
530HW01D03*	27937.01	Water	X	X		X

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
065HW00403*	27913.01	Water	X	X	X
530HW01D03*	27937.01	Water	X	X	X

* = Corresponding samples 065GW00403 and 530GW01D03 were analyzed in SDG 27868B.

HW = FIELD DUPLICATE

SDG 27868B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
023GW00103	27881.01	Water				X
023GW01D03	27881.02	Water				X
065GW00303	27936.01	Water	X		X	X
065GW00403*	27912.04	Water	X		X	X
065GW00503	27936.04	Water	X		X	X
065GW04D03	27912.03	Water	X		X	X
525GW00103	27868.02	Water				X
530GW00103	27936.05	Water	X	X		X
530GW01D03*	27936.08	Water	X	X		X
538GW00103	27912.01	Water	X			X
538GW01D03	27912.02	Water	X			X
542GW00403	27868.03	Water				X
543GW00103	27868.01	Water				X
551GW02D03	27868.04	Water				X
559GW02D03	27881.03	Water	X	X		X
065TW00403	27912.05	Water	X			
530TW01D03	27936.09	Water	X			
559TW02D03	27881.03	Water	X			
065GW00303MS	27936.02MS	Water	+		+	+
065GW00303MSD	27936.03MSD	Water	+		+	+
530GW00103MS	27936.06MS	Water	+	+		+
530GW00103MSD	27936.07MSD	Water	+	+		+

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
023GW00103	27881.01	Water	X	X	X
023GW01D03	27881.02	Water	X	X	X
065GW00303	27936.01	Water	X	X	X
065GW00403*	27912.04	Water	X	X	X
065GW00503	27936.04	Water	X	X	X
065GW04D03	27912.03	Water	X	X	X
525GW00103	27868.02	Water	X	X	X
530GW00103	27936.05	Water	X	X	X
530GW01D03*	27936.08	Water	X	X	X
538GW00103	27912.01	Water	X	X	X
538GW01D03	27912.02	Water	X	X	X
542GW00403	27868.03	Water	X	X	X
543GW00103	27868.01	Water	X	X	X
551GW02D03	27868.04	Water	X	X	X
559GW02D03	27881.03	Water	X	X	X
065GW00303MS	27936.02MS	Water	+	+	
065GW00303MSD	27936.03MSD	Water	+	+	
530GW00103MS	27936.06MS	Water	+	+	
530GW00103MSD	27936.07MSD	Water	+	+	

+ = Non-billable QC Sample
* = Corresponding duplicate samples 065HW00403 and 530HW01D03 were analyzed in SDG 27868A.

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27868A Appendix IX CLP Organics and Inorganics

SAMPLES: 065HW00403, 530HW01D03

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 the standards analyzed on 12/13/96 on instrument N were below the 0.050 QC limit for the following compounds:

acrolein	0.025
acetonitrile	0.015
propionitrile	0.049
isobutyl alcohol	0.004
1,4-dioxane	0.002

All results for these compounds in associated samples 065HW00403 and 530HW01D03, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviation (%RSD) for 1,4-dioxane was 54.0% for the standards analyzed on 12/13/96 on instrument, which was below the 30% QC limit. The non-detect results for this compound in the two associated samples were previously rejected because of a low RRF in this calibration. No further action was necessary.

Continuing Calibration:

The average Relative Response Factors (RRF's) for the standard analyzed on 12/16/96 at 09:43 on instrument N were below the 0.050 QC limit for the following compounds:

acrolein	0.020
acetonitrile	0.014
propionitrile	0.048
isobutyl alcohol	0.005
1,4-dioxane	0.002
trans-1,4-dichloro-2-butene	0.030

The non-detect result for trans-1,4-dichloro-2-butene in sample 065HW00403 was rejected (R). All results for the other five compounds in sample 065HW00403, which consisted entirely of non-detects, were previously rejected because of low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/16/96 at 09:43 on instrument N for the following compounds:

bromoform	33.5%
trans-1,4-dichloro-2-butene	47.4%

The non-detect result for trans-1,4-dichloro-2-butene was previously rejected in associated sample 065HW00403 because of a low RRF in this calibration. The non-detect result for bromoform in this sample was flagged as estimated (UJ).

The average Relative Response Factors (RRF's) for the standards analyzed on 12/17/96 at 12:02 on instrument N were below the 0.050 QC limit for the following compounds:

acrolein	0.010
acetonitrile	0.016
isobutyl alcohol	0.004
1,4-dioxane	0.002
trans-1,4-dichloro-2-butene	0.040

The non-detect result for trans-1,4-dichloro-2-butene in sample 530HW01D03 was rejected (R). All results for the other four compounds in sample 530HW01D03, which consisted entirely of non-detects, were previously rejected because of low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/17/96 at 12:02 on instrument N for the following compounds:

vinyl acetate	26.6%
dibromochloromethane	26.3%
bromoform	43.7%
tetrachloroethene	26.8%
acrolein	60.0%
trans-1,4-dichloro-2-butene	29.8%

The non-detect results for acrolein and trans-1,4-dichloro-2-butene in associated sample 530HW01D03 were previously rejected because of low RRF's in the initial and continuing calibrations. The non-detect results for the four other compounds in sample 530GW01D03 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Trip Blanks:

There were no positive detections in the three trip blanks, which were analyzed in SDG 27868B. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two field duplicate sample pairs in this SDG. No action was required.

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 results for acrolein, acetonitrile, propionitrile, trans-1,4-dichloro-2-butene, isobutyl alcohol and 1,4-dioxane, which consisted entirely of non-detects, were rejected in the two SDG 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. 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 hexachlorophene was 0.041 for the standards analyzed on 12/20/96 on instrument A, which was below the 0.050 QC limit. The non-detect result for this compound in sample 530HW01D03 was rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 12/20/96 on instrument A for the following compounds:

methyl methanesulfonate	36.5%
ethyl methanesulfonate	36.3%
acetophenone	35.2%
n-nitrosomorpholine	31.4%
o-toluidine	38.4%
o,o,o-triethylphosphorothioate	34.6%
hexachloropropene	30.7%
2,6-dichlorophenol	33.3%
1,2,4,5-tetrachlorobenzene	32.0%
safrole	34.9%
isosafrole	33.3%
1,4-naphthoquinone	38.8%
1,3-dinitrobenzene	43.1%
1-naphthylamine	43.0%
2-naphthylamine	44.9%
4-nitroquinoline-1-oxide	47.0%
thionazin	30.9%
diphenylamine	33.7%
sulfotep	37.2%

1,3,5-trinitrobenzene	33.7%
phorate	32.0%
phenacetin	35.2%
diallate	30.9%
dimethoate	38.2%
4-aminobiphenyl	42.7%
pronoamide	37.5%
pentachloronitrobenzene	35.9%
disulfoton	35.8%
2-sec-butyl-4,6-dinitrophenol	44.4%
methyl parathion	39.7%
parathion	36.2%
methapyrilene	51.0%
chlorobenzilate	30.9%
3,3'-dimethylbendidine	38.6%
kepone	43.9%
famphur	76.4%
acetamidofluorene	35.1%
7,12-dimethylbenz(a)anthracene	34.9%
2-picoline	42.8%
m-cresol	32.7%

Since these compounds were not detected in sample 530HW01D03, no action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.045) and hexachlorophene (0.028) were below the 0.050 QC limit for the standards analyzed on 1/8/97 at 14:00 on instrument A. The non-detect result for hexachlorophene in sample 530HW01D03 was previously rejected because of a low RRF in the initial calibration. The non-detect result for aramite in this sample was rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 1/8/97 at 14:00 for the following compounds:

methyl methanesulfonate	44.2%
ethyl methanesulfonate	43.5%
n-nitrosomethylethylamine	47.9%
n-nitrosodiethylamine	48.1%
acetophenone	46.1%
2-picoline	57.9%
n-nitrosopyrrolidine	44.7%
n-nitrosomorpholine	38.4%
n-nitrosopiperidine	43.7%
o-toluidine	51.1%
o,o,o-triethylphosphorothioate	30.0%
n-nitrosodi-n-butylamine	33.5%
1,2,4,5-tetrachlorobenzene	77.2%
safrole	50.0%

isosafrole	42.0%
1-naphthylamine	30.0%
2-naphthylamine	40.4%
thionazin	28.5%
diphenylamine	62.4%
sulfotep	105%
phorate	29.7%
diallate	32.2%
4-aminobiphenyl	45.1%
pronoamide	34.6%
isodrin	28.8%
3,3'-dimethylbendidine	48.5%
famphur	98.8%
acetamidofluorene	35.1%
7,12-dimethylbenz(a)anthracene	35.3%
m-cresol	42.1%
p-phenylenediamine	46.0%
hexachlorophene	31.7%
2,2'-oxybis(1-chloropropane)	32.4%
2-methylphenol	48.0%
2,6-dichlorophenol	78.1%
hexachloropropene	50.2%
pentachlorobenzene	92.6%

The non-detect result for hexachlorophene was previously rejected because of low RRF's in the initial and continuing calibrations. All results for the other compounds in associated sample 530HW01D03, which consisted entirely of non-detects were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 5 ug/L in method blank SBLK1. The positive detection of this compound in sample 530HW01D03, 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

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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 aramite and hexachlorophene were rejected in sample 530HW01D03 because of low RRF's in the initial and continuing calibrations. All other laboratory data were acceptable with qualification.s

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:

All Continuing Calibration criteria were met. No action was taken.

IV.) 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 required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed by the laboratory. All Recovery 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 required.

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 calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this 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):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	2.84 ug/L	14.2 ug/L
PBW	chromium	1.75 ug/L	8.75 ug/L
CCB3	selenium	3.80 ug/L	19.0 ug/L
CCB1	tin	3.00 ug/L	15.0 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	iron	-41.9 ug/L	210 ug/L
CCB1	nickel	-0.80 ug/L	4.00 ug/L
CCB3	silver	-1.80 ug/L	9.00 ug/L
CCB1	thallium	-2.80 ug/L	14.0 ug/L
CCB4	vanadium	-0.80 ug/L	4.00 ug/L

CCB = Continuing Calibration Blank

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	4 ug/L
chromium	1 ug/L
cobalt	1 ug/L
nickel	3 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
cadmium	-1 ug/L
copper	-1 ug/L
lead	-4 ug/L
manganese	-1 ug/L
vanadium	-1 ug/L

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

V.) ICP Serial Dilution Analysis:

ICP Serial Dilution Analysis was not performed in this fraction of the 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples, 065HW00403 / 5065GW00403 (analyzed in SDG 27868B) and 530HW01D03 / 530GW01D03 (analyzed in SDG 27868B), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	065HW00403, ug/L	065GW00403, ug/L	RPD
calcium	41800	41300	1.2%
iron	222	210	0.9%
manganese	40.5	39.9	1.5%
sodium	22200	21800	1.8%

Analyte	530HW01D03, ug/L	530GW01D03, ug/L	RPD
calcium	64600	64900	0.5%
iron	152	161	5.8%
magnesium	8150	8180	0.4%
manganese	110	110	0%
sodium	118000	116000	1.7%

one of the Relative Percent Differences (RPD's) exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides were 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.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 065HW00403 and 065GW00403 (analyzed in SDG 27678B) was 11.1%, which was within the 30% QC limit for water samples. No action was required.

The Relative Percent Difference (RPD) for field duplicate samples 530HW00103 and 530GW00103 (analyzed in SDG 27678B) was 2.3%, which 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.

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 blank. 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 065HW00403 and 065GW00403

(analyzed in SDG 27678B) was 0.7%. The RPD for field duplicate samples 530HW00103 and 530GW00103 (analyzed in SDG 27678B) was 1.3%. Both 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:

TDS 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.) 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 065HW00403 and 065GW00403 (analyzed in SDG 27678B) was 41.4%, which exceeded the 30% QC limit for water samples. The positive detections of TDS in the two samples were flagged as estimated (J).

The Relative Percent Difference (RPD) for field duplicate samples 530HW00103 and 530GW00103 (analyzed in SDG 27678B) was 2.3%, which was 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 Laboratories of Oklahoma, Inc. - 27868B CLP Organics and Inorganics

SAMPLES: 023GW00103, 023GW01D03, 065GW00303, 065GW00403, 065GW00503, 065GW04D03, 525GW00103, 530GW00103, 530GW01D03, 538GW00103, 538GW01D03, 542GW00403, 543GW00103, 551GW02D03, 559GW02D03, 065TW00403, 530TW01D03, 559TW02D03, 065GW00303MS, 065GW00303MSD, 530GW00103MS, 530GW00103MSD

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) for bromoform was 33.5% for the standard analyzed on 12/16/96 at 09:43 on instrument N, which exceeded the 25% QC limit. The non-detect result for bromoform in associated sample 559GW02D03 was flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/17/96 at 12:02 on instrument N for the following compounds:

vinyl acetate	26.6%
dibromochloromethane	26.3%
bromoform	43.7%
tetrachloroethene	26.8%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 065GW00303, 065GW00503, 530GW00103,

530GW01D03, 538GW00103 and 538GW01D03.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/18/96 at 09:02 on instrument N for the following compounds:

acetone	32.3%
dibromochloromethane	26.7%
bromoform	44.1%
tetrachloroethene	28.9%

The non-detect results for these compounds in the associated samples 065GW00403 and 065GW04D03 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Trip Blanks:

There were no positive detections in the three trip blanks in this SDG. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the two field duplicate sample sets in this SDG. No action was required.

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 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) for hexachlorocyclopentadiene and 2,6-dinitrotoluene were 33.5% and 32.7%, respectively, for the standards analyzed on 1/2/97 on instrument S, which exceeded the 30% QC limit. Since there were no positive detections of these two compounds in the associated samples, 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 taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. One Percent Recovery was below the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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 laboratory data were acceptable without qualification.

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:

All Initial and Continuing Calibration criteria were met. No action was taken.

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 required.

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed by the laboratory. All 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.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate sample pair 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 cleanup was not required in this SDG. No action was necessary.

XI.) 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	2.84 ug/L	14.2 ug/L
PBW	chromium	1.75 ug/L	8.75 ug/L
CCB3	selenium	3.80 ug/L	19.0 ug/L
CCB1	tin	3.00 ug/L	15.0 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB3	iron	-41.9 ug/L	210 ug/L
CCB1	nickel	-0.80 ug/L	4.00 ug/L
CCB3	silver	-1.80 ug/L	9.00 ug/L
CCB1	thallium	-2.80 ug/L	14.0 ug/L
CCB4	vanadium	-0.80 ug/L	4.00 ug/L

CCB = Continuing Calibration Blank

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	4 ug/L
chromium	1 ug/L
cobalt	1 ug/L
nickel	3 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
cadmium	-1 ug/L
copper	-1 ug/L
lead	-4 ug/L
manganese	-1 ug/L
vanadium	-1 ug/L

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

V.) ICP Serial Dilution Analysis:

The ICP Serial Dilution Percent Difference (%D) for iron was 20.5% for dilution sample 065GW00303L, which exceeded the 10% QC limit. All positive results for iron in the 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 required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples, 065GW00403 / 5065HW00403 (analyzed in SDG 27868A) and 530GW01D03 / 530HW01D03 (analyzed in SDG 27868A), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	065HW00403, ug/L	065GW00403, ug/L	RPD
calcium	41800	41300	1.2%
iron	222	210	0.9%
manganese	40.5	39.9	1.5%
sodium	22200	21800	1.8%

Analyte	530HW01D03, ug/L	530GW01D03, ug/L	RPD
calcium	64600	64900	0.5%
iron	152	161	5.8%
magnesium	8150	8180	0.4%
manganese	110	110	0%
sodium	118000	116000	1.7%

None of the Relative Percent Differences (RPD's) exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

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 criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 065GW00403 and 065HW00403 (analyzed in SDG 27678A) was 11.1%. The RPD for field duplicate samples 530GW00103 and 530HW00103 (analyzed in SDG 27678A) was 2.3%. Both 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.

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 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 criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples 065GW00403 and 065HW00403 (analyzed in SDG 27678A) was 0.7%. The RPD for field duplicate samples 530GW00103 and 530HW00103 (analyzed in SDG 27678A) was 1.3%. Both 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:

TDS 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.) 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 065GW00403 and 065HW00403 (analyzed in SDG 27678A) was 41.4%, which exceeded the 30% QC limit for water samples. The positive results for TDS in the two samples were flagged as estimated (J).

The Relative Percent Difference (RPD) for field duplicate samples 530GW00103 and 530HW00103 (analyzed in SDG 27678A) was 2.3%, which was 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.

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:	0181
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	27955 (Level IV, App. IX) 27955 (Level III)

SAMPLES:

SDG 27995A (Level IV):

Client Sample #	Lab Sample #	Matrix	Pesticides/ PCB's	Total Metals	Chlorides	Sulfates	TDS
598DW00103	27993.01	Water	X	X	X	X	X
598EW00103	27993.02	Water	X	X	X	X	X
598FW00103	27993.03	Water	X	X	X	X	X

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK

SDG 27955B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
053GW00103	27982.01	Water				X
063GW00103	27973.01	Water				X
063GW00203	27973.02	Water				X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
065GW00103	27955.04	Water	X		X	X
065GW00203	27955.03	Water	X		X	X
065GW00603	27973.05	Water	X		X	X
530GW00203	27955.01	Water	X	X		X
530GW02D03	27955.02	Water	X	X		X
539GW00103	27982.04	Water	X			X
539GW01D03	27982.03	Water	X			X
598GW00103	27994.01	Water			X	X
599GW00103	28013.01	Water			X	X
063DW00103	27973.02	Water	X	X	X	X
063EW00103	27973.03	Water	X	X	X	X
063FW00103	27973.04	Water	X	X	X	X
065TW00103	27955.05	Water	X			
065TW00603	27973.06	Water	X			
539TW00103	27982.05	Water	X			
599GW00103MS	28013.02S	Water			+	+
599GW00103MSD	28013.03SD	Water			+	+

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
053GW00103	27982.01	Water	X	X	X
063GW00103	27973.01	Water	X	X	X
063GW00203	27973.02	Water	X	X	X
065GW00103	27955.04	Water	X	X	X
065GW00203	27955.03	Water	X	X	X
065GW00603	27973.05	Water	X	X	X
530GW00203	27955.01	Water	X	X	X
530GW02D03	27955.02	Water	X	X	X
539GW00103	27982.04	Water	X	X	X
539GW01D03	27982.03	Water	X	X	X
598GW00103	27994.01	Water	X	X	X
599GW00103	28013.01	Water	X	X	X
063DW00103	27973.02	Water	X	X	X
063EW00103	27973.03	Water	X	X	X
063FW00103	27973.04	Water	X	X	X
599GW00103MS	28013.02S	Water	+	+	
599GW00103MSD	28013.03SD	Water	+	+	

+ = Non-billable QC Sample

DW = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27955A Appendix IX CLP Organics and Inorganics

SAMPLES: 598DW00103, 598EW00103, 598FW00103

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:

All Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

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 blank samples. No 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 by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

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 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):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

The following blank results represent the highest detections associated with the samples:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	3.51 ug/L	17.6 ug/L
PBW	barium	0.36 ug/L	1.80 ug/L
PBW	beryllium	0.30 ug/L	1.50 ug/L

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	calcium	18.0 ug/L	90.0 ug/L
CCB2	copper	2.30 ug/L	11.5 ug/L
CCB3	mercury	0.20 ug/L	1.00 ug/L
PBW	thallium	5.02 ug/L	25.1 ug/L
CCB4	tin	2.70 ug/L	13.5 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

The only associated samples were three field blanks. No action was necessary.

Selenium had a negative value of -3.11 ug/L in the water preparation blank with an absolute value greater than the IDL. Since the only associated samples were three field blanks, 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:

arsenic	7 ug/L
chromium	1 ug/L
cobalt	1 ug/L
nickel	3 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
copper	-1 ug/L
thallium	-6 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

ICP Serial Dilution Analysis was not performed in this fraction of the 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples were not analyzed 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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 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:

Chlorides were 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.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

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:

TDS 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.) 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:

Field duplicate samples were not analyzed in this SDG. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 27955B CLP Organics and Inorganics

SAMPLES: 053GW00103, 063GW00103, 063GW00203, 065GW00103, 065GW00203, 065GW00603, 530GW00203, 530GW02D03, 539GW00103, 539GW01D03, 598GW00103, 599GW00103, 063DW00103, 063EW00103, 063FW00103, 065TW00103, 065TW00603, 539TW00103, 599GW00103MS, 599GW00103MSD

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/17/96 at 12:02 on instrument N for the following compounds:

vinyl acetate	26.6%
dibromochloromethane	26.3%
bromoform	43.7%
tetrachloroethene	26.8%

All results for these compounds in the associated sample, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 065GW00103, 065GW00203, 065GW00603, 530GW00203 and 530GW02D03.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 12/18/96 at 09:02 on instrument N for the following compounds:

vinyl acetate	32.3%
dibromochloromethane	26.7%

bromoform	44.1%
tetrachloroethene	28.9%

The non-detect results for these compounds in the associated samples 539GW00103 and 539GW01D03 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:

Acetone (18 ug/L) and chloroform (1 ug/L) were detected in deionized water blank 063DW00103. There were no positive detections of these compounds in the associated samples. No action was required.

Equipment Rinsate and Field Blanks:

Chloroform was detected at 2 ug/L each in equipment rinsate blank 065EW00103 and field blank 065FW00103. Since there were no positive detections of this compound in the associated samples, no action was necessary.

Trip Blanks:

There were no positive detections in the three trip blanks in this SDG. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

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 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 taken.

Continuing Calibration:

The Percent Difference (%D) for 2,4-dinitrophenol was 42.2% for the standard analyzed on 1/7/97 at 06:28 on instrument V, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample 530GW00203 was flagged as estimated (UJ).

V.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

TIC's:

2-Pentanone and ethyl-methyl-heptene were detected in the method and field blanks at sufficient concentrations to eliminate (using the 5X blank qualification rule) their detections in the two SDG samples. Data flagging was not required for TIC's. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. Two Percent Recoveries were below the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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 laboratory data were acceptable with one qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Difference (%D) for endrin was 28.8% for the PEM6E standard analyzed on 12/26/96 at 13:33 on the primary column, which exceeded the 25% QC limit. The non-detect results for endrin in the associated samples were flagged as estimated (UJ). The associated samples were 065GW00103, 065GW00203, 598GW00103 and 599GW00103.

The Percent Differences (%D's) for endrin and gamma-BHC were 60.2% and 28.0%, respectively, for the PEM6F standard analyzed on 12/27/96 at 05:18 on the primary column, which exceeded the 25% QC limit. The non-detect results for endrin were previously qualified based on PEM standard PEM6E. The non-detect results for gamma-BHC in the associated samples were flagged as estimated (UJ). The associated samples were 065GW00103, 065GW00203, 598GW00103 and 599GW00103.

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 12/26/96 at 21:16 on the primary column for the following compounds:

dieldrin	26.1%
endrin	53.2%
heptachlor epoxide	30.1%
endosulfan II	53.4%
endosulfan sulfate	36.6%
endrin aldehyde	42.4%
alpha-chlordane	29.1%

The non-detect results for endrin were previously qualified based on the PEM standards. The non-detect results for the other compounds in the associated samples were flagged as estimated (UJ). The associated samples were 065GW00103, 065GW00203, 598GW00103 and 599GW00103.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 12/27/96 at 05:45 on the primary column for the following compounds:

gamma-BHC	31.6%
endrin	50.8%
heptachlor	25.9%
endosulfan II	32.5%
4,4'-DDD	31.2%
alpha-chlordane	30.4%

The non-detect results for gamma-BHC, endrin, endosulfan II and alpha-chlordane were previously qualified based on the PEM's and previous continuing calibration standards. The non-detect results for the other compounds in the associated samples were flagged as estimated (UJ). The associated samples were 065GW00103, 065GW00203, 598GW00103 and 599GW00103.

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. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) for gamma-BHC was 16% for spiked samples 599GW00103MS and 599GW00103MSD, which exceeded the 15% QC limit. The non-detect result for this compound in unspiked sample 599GW00103 was previously qualified based on the PEM and continuing calibration standards. No further action was necessary.

The Percent Difference (%D) for 4,4'-DDE was 69% for spiked sample 599GW00103MSD, which was below the 70-122% QC limits. The non-detect result for this compound in associated unspiked sample 599GW00103 was flagged as estimated (UJ).

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed 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 cleanup was not required in this SDG. No action was necessary.

XI.) 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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
FW1	antimony	4.80 ug/L	24.0 ug/L
PBW	barium	0.36 ug/L	1.80 ug/L
FW1	beryllium	0.44 ug/L	2.20 ug/L
PBW	calcium	18.0 ug/L	90.0 ug/L
DW2	chromium	1.20 ug/L	6.00 ug/L
FW1	cobalt	1.20 ug/L	6.00 ug/L

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB2	copper	2.30 ug/L	11.5 ug/L
CCB3	mercury	0.20 ug/L	1.00 ug/L
CCB4	tin	2.70 ug/L	13.5 ug/L
EW2	zinc	5.70 ug/L	28.5 ug/L

Note: DW2 and EW2 blanks were analyzed in SDG 27955A.

CCB = Continuing Calibration Blank, DW2 = Deionized Water Blank (598DW00103), EW2 = Equipment Rinsate Blank (598EW00103), FW1 = Field Blank (065FW00103), 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).

A negative result with an absolute value greater than the IDL were observed for selenium (-3.11 ug/L) in the water preparation blank. All associated positive sample results less than 5X the absolute value of the negative blank result and all associated non-detects for selenium 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
chromium	1 ug/L
cobalt	1 ug/L
nickel	3 ug/L

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

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

antimony	-5 ug/L
barium	-1 ug/L
copper	-1 ug/L
thallium	-6 ug/L
vanadium	-2 ug/L

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

V.) ICP Serial Dilution Analysis:

All ICP Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of manganese were 64.1% and 63.2%, respectively, for spiked water samples 599GW00103MS and 599GW00103MSD, which were below the 75-125% QC limits. In addition, the %R for potassium was 70.6% for spiked sample 599GW00103MSD, which was below the 75-125% QC limit. All positive and non-detect results for these two analytes in the SDG samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Field duplicate samples were not analyzed 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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.

Deionized Water Blanks:

Chlorides were detected at 0.30 mg/L in deionized water blank 598DW00103, which was analyzed in SDG 27955A. Chlorides were not detected in deionized water blank 063DW00103. The equipment rinsate blanks were used for blank qualification. No further action was required.

Equipment Rinsate Blanks:

Chlorides were detected at 0.30 ug/L in deionized water blank 063EW00103 and 0.50 mg/L in deionized water blank 598EW00103, which was analyzed in SDG 27955A. The detections of chlorides in associated samples 063GW00203 and 065GW00603, which were less than 5X the blank amounts, were flagged as undetected (U) with the detection limits being raised to the amount of contamination in each sample.

Field Blank:

Chlorides were not detected in field blanks 063FW00103 and 598FW00103 (analyzed in SDG 27955A). 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 Percent Recovery criteria were met. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

VII.) 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. No action was necessary.

Deionized Water Blanks:

Sulfates were detected at 0.20 mg/L and 0.30 mg/L, respectively in deionized water blanks 063DW00103 and 598DW00103 (analyzed in SDG 27955A). The detections of sulfates in associated samples 065GW00103, 065GW00603 and 599GW00103, which were less than 5X the blank amounts, were flagged as undetected (U) with the detection limits being raised to the amount of contamination in each sample.

Equipment Rinsate Blanks:

Sulfates were detected at 0.20 ug/L in equipment rinsate blank 063EW00103. Sulfates were not detected in equipment rinsate blank 598EW00103, which was analyzed in SDG 27955A. The deionized water blanks were used for blank qualifications. No further action was necessary.

Field Blanks:

Sulfates were not detected in field blanks 063FW00103 and 598FW00103 (analyzed in SDG 27955A. 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 Percent Recovery criteria were met. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. 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 Blank:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water and Equipment Rinsate Blanks:

TDS was detected at 40 mg/L and 64 mg/L, respectively, in deionized water blank 063DW00103 and equipment rinsate blank 063EW00103. TDS was not detected in deionized water blank 598DW00103 and equipment rinsate blank 598EW00103, which were analyzed in SDG 27955A. Since the field blanks were used for blank qualifications, no further action was taken.

Field Blanks:

TDS was not detected in field blank 063FW00103. TDS was detected at 120 mg/L in field blank 598FW00103, which was analyzed in SDG 27955A. Detections of TDS in the associated samples less than 5X the blank amount were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample. The associated samples requiring qualification were 063GW00103, 065GW00603, 530GW00203, 530GW02D03, 539GW00103 and 539GW01D03.

IV.) Laboratory Check Samples (LCS):

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

V.) Laboratory Duplicate Analysis:

Laboratory Duplicate Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was necessary.

VIII.) 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:	0193
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28100 A (Level IV, Appendix IX) 28100 B (Level III)

SAMPLES:

SDG 28100A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
605HW00304*	28112-01	Water				X
106DW01D04	28138-01	Water	X	X	X	X
106EW01D04	28138-02	Water	X	X	X	X
106FW01D04	28138-03	Water	X	X	X	X
106DW01D04MS	28138-01MS	Water	+			
106DW01D04MSD	28138-01MSD	Water	+			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
106DW01D04	28138-01	Water	X	X	X	X
106EW01D04	28138-02	Water	X	X	X	X
106FW01D04	28138-03	Water	X	X	X	X

* = Corresponding sample 605GW00304 was analyzed in SDG 28100B.
+ = Non-billable Quality Control analysis

H = FIELD DUPLICATE, D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

SDG 28100B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
018GW00104	28100.01	Water				X
018GW00204	28100.02	Water				X
106GW00104	28111.02	Water				X
106GW01D04	28111.01	Water				X
605GW00104	28100.03	Water				X
605GW00204	28100.04	Water				X
605GW00304*	28139.01	Water				X
GDEGW00104	28100.05	Water	X	X	X	X
GDEGW00304	28100.06	Water	X	X	X	X
GDEGW00404	28111.03	Water	X	X	X	X
GDEGW00604	28111.04	Water	X	X	X	X
106TW01D04	28139.02	Water	X			
GDETW00304	28100.07	Water	X			
GDETW00604	28111.05	Water	X			
GDEGW00104MS	28100.05MS	Water	+			
GDEGW00104MSD	28100.05MSD	Water	+			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
018GW00104	28100.01	Water		X	X	X
018GW00204	28100.02	Water		X	X	X
106GW00104	28111.02	Water		X	X	X
106GW01D04	28111.01	Water		X	X	X
GDEGW00104	28100.05	Water	X	X	X	X
GDEGW00304	28100.06	Water	X	X	X	X
GDEGW00404	28111.03	Water	X	X	X	X
GDEGW00604	28111.04	Water	X	X	X	X

* = Field duplicate sample 605HW00304 was analyzed in SDG 28100A.
+ = Non-billable Quality Control analysis

D = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28100A Appendix IX, CLP Organics and Inorganics

SAMPLES: 605HW00304, 106DW01D04, 106EW0D104, 106FW0D104, 106DW01D04MS, 106DW01D04MSD

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 the standards analyzed on 1/13/97 on instrument N were below the 0.050 QC limit for the following compounds:

trans-1,4-dichloro-2-butene	0.046
acetonitrile	0.036
isobutyl alcohol	0.007
1,4-dioxane	0.002

All results for these compounds in the three field blanks, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for the standard analyzed on 1/15/97 at 12:05 on instrument N were below the 0.050 QC limit for the following compounds:

trans-1,4-dichloro-2-butene	0.044
acetonitrile	0.037
isobutyl alcohol	0.009
1,4-dioxane	0.003

All results for these compounds in the three field blanks, which consisted entirely of non-detects, were previously rejected because of low RRF's in the initial calibration. No further action was necessary.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Trip Blank:

There were no positive detections in trip blank 106TW01D04, which was analyzed in SDG 28100A. No action was taken.

TIC's:

TIC's were not detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (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):

All MS / MSD criteria were met. No action was necessary.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

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 trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected the three SDG field blanks. All other laboratory data were acceptable without qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

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 taken.

TIC's:

TIC's were not detected in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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 laboratory data were acceptable without qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Endrin Breakdown was 36.8% for the PEM6U standard analyzed on 1/16/97 at 23:05 on the secondary column, which exceeded the 20% QC limit. In addition, the combined endrin and 4,4'-DDT breakdown was 43.2%, which exceeded the 30% QC limit. Since there were no positive detections of endrin, endrin aldehyde or endrin ketone in the SDG samples, 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 for the standards analyzed on 1/16/97 at 23:39 on the secondary column for the following compounds:

alpha-BHC	27.0%
beta-BHC	28.5%
gamma-BHC	35.1%
delta-BHC	28.6%
endrin	27.9%
endosulfan II	34.9%
endosulfan sulfate	53.1%
endrin aldehyde	36.5%
endrin ketone	59.3%

Since the associated samples were three field blanks, no action was required.

IV.) 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 required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

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 required.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check data were not included in the data package. No action was required.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) 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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB10	antimony	4.60 ug/L	23.0 ug/L
ICB	barium	0.50 ug/L	2.50 ug/L
DWB	beryllium	0.32 ug/L	1.60 ug/L
FB	calcium	35.1 ug/L	176 ug/L
ERB	copper	1.70 ug/L	8.50 ug/L
DWB	mercury	0.23 ug/L	1.15 ug/L
ERB	nickel	1.20 ug/L	6.00 ug/L
CCB6	silver	1.90 ug/L	9.50 ug/L
FB	selenium	4.50 ug/L	22.5 ug/L
PBW	zinc	47.3 ug/L	237 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank,
ERB = Equipment Rinsate Blank, FB = Field Blank,
ICB = Initial 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, 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB12	calcium	-87.1 ug/L	436 ug/L
PBW	iron	-32.2 ug/L	161 ug/L
CCB12	magnesium	-92.0 ug/L	460 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All associated sample results were greater than 5X the absolute value of the negative blank results. No action was taken.

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:

cadmium	2 ug/L
copper	1 ug/L
cobalt	1 ug/L
lead	5 ug/L
manganese	1 ug/L
selenium	9 ug/L
thallium	6 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 in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

copper	-4 ug/L
selenium	-5 ug/L
tin	-2 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:

ICP Serial Dilution Analysis was not performed in this fraction of the 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples, 605HW00304 and 605GW00304 (analyzed in SDG 28100B), was evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	605HW00304, ug/L	605GW00304, ug/L	RPD
arsenic	82.7	86.0	3.9%
calcium	96400	99200	2.9%
iron	9420	9700	2.9%
magnesium	11900	12300	3.3%
manganese	288	295	2.4%
potassium	9550	9780	2.3%
sodium	40400	42900	6.0%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides were not detected in the method blank. 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

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:

TDS 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.) 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:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28100B CLP Organics and Inorganics

SAMPLES: 018GW00104, 018GW00204, 106GW00104, 106GW01D04, 605GW00104, 605GW00204, 605GW00304, GDEGW00104, GDEGW00304, GDEGW00404, GDEGW00604, 106TW01D04, GDETW00304, GDETW00604, GDEGW00104MS, GDEGW00104MSD

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) for 2-hexanone exceeded the 25% QC limit for the standard analyzed on 1/15/97 on instrument N. Since the only associated sample was a trip blank, no action was taken.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 28100A. No action was necessary.

Trip Blanks:

There were no positive detections in the three trip blanks analyzed in this SDG. No action was taken.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed for this SDG. Two Percent Recoveries (%R's) were below the QC limits. Data validation action based on LCS criteria was not necessary. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

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 without qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. 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) for the standards analyzed on 12/30/96 on instrument P exceeded the 30% QC limits for the following compounds:

benzoic acid	31.5%
hexachlorocyclopentadiene	30.7%
2,4-dinitrophenol	32.5%

There were no detections of these compounds in the associated samples. No action was necessary.

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 1/2/97 on instrument S exceeded the 30% QC limits for the following compounds:

hexachlorocyclopentadiene	33.5%
2,6-dinitrotoluene	32.7%

There were no detections of these compounds in the associated samples. No action was taken.

Continuing Calibration:

The Percent Differences (D's) for the standards analyzed on 1/13/97 at 09:09 on instrument P exceeded the 25% QC limits for the following compounds:

hexachlorocyclopentadiene	29.2%
2,4-dinitrophenol	29.9%
3,3'-dichlorobenzidine	27.9%

The non-detect results for these compounds in associated sample GDEGW00604 were flagged as estimated (UJ).

The Percent Difference (%D) for 3,3'-dichlorobenzidine was 26.5% for the standard analyzed on 1/9/97 at 06:42 on instrument S, which exceeded the 25% QC limit. The non-detect results for this compound in associated samples GDEGW00104 and GDEGW00304 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 28100A. No action was necessary.

TIC's:

TIC's were not detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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 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:

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 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 28100A. 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 by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check data were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. 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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB10	antimony	4.60 ug/L	23.0 ug/L
ICB	barium	0.50 ug/L	2.50 ug/L
DWB	beryllium	0.32 ug/L	1.60 ug/L
FB	calcium	35.1 ug/L	176 ug/L
ERB	copper	1.70 ug/L	8.50 ug/L
DWB	mercury	0.23 ug/L	1.15 ug/L

Blank Type/ID#	Analyte	Max. Conc.	Action Level
ERB	nickel	1.20 ug/L	6.00 ug/L
CCB12	silver	1.90 ug/L	9.50 ug/L
FB	selenium	4.50 ug/L	22.5 ug/L
CCB10	tin	1.10 ug/L	5.50 ug/L
ERB	zinc	6.90 ug/L	34.5 ug/L
ERB	cyanide	9.80 ug/L	49.0 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,
DW = Deionized Water Blank 106DW01D04 (analyzed in SDG 28100A),
EW = Equipment Rinsate Blank 106EW01D04 (analyzed in SDG 28100A),
FW = Field Blank 106FW01D04 (analyzed in SDG 28100), 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).

A negative result for mercury (-0.10 ug/L) was observed in the Initial Calibration Blank (ICB). All associated positive sample results less than 5X the absolute value of the negative blank result 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:

cadmium	2 ug/L
copper	1 ug/L
cobalt	1 ug/L
lead	5 ug/L
manganese	1 ug/L
selenium	9 ug/L
thallium	6 ug/L
vanadium	1 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 in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

copper	-4 ug/L
selenium	-5 ug/L
tin	-2 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:

The ICP Serial Dilution Percent Differences (%D's) for arsenic (10.5%), iron (11.4%), sodium (26.3%) and manganese (10.5%) exceeded the 10% QC limit for dilution sample GDEGW00304L. All positive results for these compounds in the associated 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples 605GW00304 and 605HW00304 (analyzed in SDG 28100A) were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	605HW00304, ug/L	605GW00304, ug/L	RPD
arsenic	82.7	86.0	3.9%
calcium	96400	99200	2.9%
iron	9420	9700	2.9%
magnesium	11900	12300	3.3%
manganese	288	295	2.4%
potassium	9550	9780	2.3%
sodium	40400	42900	6.0%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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.

Deionized Water and Field Blanks:

Chlorides were not detected in the two field blanks, which were analyzed in SDG 28100A. No action was taken.

Equipment Rinsate Blank:

Chlorides were detected at 0.26 mg/L in equipment rinsate blank 106EW01D04, which was analyzed in SDG 28100A. Since all detections of chlorides in the associated samples exceeded 5X this amount, 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 28100A. No 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

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:

TDS was not detected in the method blanks. No action was necessary.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field blanks, which were analyzed in SDG 28100A. No 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 fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

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:	0196
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHOD:	EPA SOW 3-90 or SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28149A (Level IV, Appendix IX) 28149B (Level III)

SAMPLES:

SDG 28149A (Level IV):

Client Sample #	Lab Sample #	Matrix	Total Metals	Chlorides	Sulfates	TDS
596HW00104*	28150-01	Water	X	X	X	X

* = Corresponding sample 596GW00104 was analyzed in SDG 28149B.

HW = FIELD DUPLICATE

SDG 28149B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
100GW00104	28173-03	Water				X
590GW00104	28173-01	Water				X
590GW01D04	28173-02	Water				X
596GW00104	28149-01	Water				X
596GW00204	28149-03	Water				X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
596GW00304	28158-01	Water				X
596GW00404	28158-02	Water				X
596GW01D04	28149-02	Water				X
596GW04D04	28158-03	Water				X
GDEGW00804	28158-04	Water	X	X	X	X
GDEGW00804DL	28158-04DL	Water		+		
GDEGW00904	28149-04	Water	X	X	X	X
GDEGW08D04	28173-04	Water	X	X	X	X
GDEGW09D04	28149-05	Water	X	X	X	X
GDEDW00804	28158-05	Water	X	X	X	X
GDEEW00804	28158-06	Water	X	X	X	X
GDEFW00804	28158-07	Water	X	X	X	X
GDETW00804	28158-08	Water	X			
GDETW00904	28149-06	Water	X			
GDETW08D04	28173-05	Water	X			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
100GW00104	28173-03	Water		X	X	X
590GW00104	28173-01	Water		X	X	X
590GW01D04	28173-02	Water		X	X	X
596GW00104*	28149-01	Water		X	X	X
596GW00204	28149-03	Water		X	X	X
596GW00304	28158-01	Water		X	X	X
596GW00404	28158-02	Water		X	X	X
596GW01D04	28149-02	Water		X	X	X
596GW04D04	28158-03	Water		X	X	X
GDEGW00804	28158-04	Water	X	X	X	X
GDEGW00904	28149-04	Water	X	X	X	X
GDEGW08D04	28173-04	Water	X	X	X	X
GDEGW09D04	28149-05	Water	X	X	X	X
GDEDW00804	28158-05	Water	X	X	X	X
GDEEW00804	28158-06	Water	X	X	X	X
GDEFW00804	28158-07	Water	X	X	X	X

* = Field duplicate sample 596HW00304 was analyzed in SDG 28149A.
+ = Non-billable analysis

DL = DILUTION, DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28149A Appendix IX, CLP Organics and Inorganics

SAMPLE: 596HW00104

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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB1	antimony	4.20 ug/L	21.0 ug/L
FB	beryllium	0.31 ug/L	1.55 ug/L
ERB	calcium	40.0 ug/L	200 ug/L
ERB	chromium	1.50 ug/L	7.50 ug/L
ERB	mercury	0.43 ug/L	2.15 ug/L
FB	nickel	1.30 ug/L	6.50 ug/L
CCB4	selenium	3.90 ug/L	19.5 ug/L
CCB3	silver	1.90 ug/L	9.50 ug/L
DWB	tin	2.70 ug/L	13.5 ug/L
ERB	zinc	6.40 ug/L	32.0 ug/L
DWB	cyanide	7.00 ug/L	35.0 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank GDEDW00804,
ERB = Equipment Rinsate Blank (GDEEW00804), FB = Field Blank (GDEFW00804)

Field Blanks DWB, ERB and FB were analyzed in SDG 28149B. All results above 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, deionized water, equipment rinsate or field blank were flagged as undetected (U).

Negative results were not found in the calibration and preparation blanks associated with this SDG. 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	2 ug/L
cadmium	2 ug/L
cobalt	1 ug/L
lead	2 ug/L
manganese	1 ug/L
thallium	3 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 in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

copper	-4 ug/L
selenium	-5 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:

All Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples 596HW00104 and 596GW00104 (analyzed in SDG 28149B) were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	596HW00104, ug/L	596GW00104, ug/L	RPD
arsenic	16.5	15.0	9.5%
barium	21.3	20.0	6.3%
calcium	92300	88000	4.8%
iron	12800	12300	4.0%
magnesium	16200	15200	6.4%
manganese	263	247	6.3%
potassium	10600	9790	7.9%
sodium	73900	70000	5.4%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides were not detected in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Chlorides were not detected in the equipment rinsate and field blanks, which were analyzed in SDG 28149B. Chlorides were detected at 0.23 mg/L in deionized water blank GDEDW00804, which was analyzed in SDG 28149B. Since the detection of chloride in sample 596HW00104 was greater than 5X this amount, no 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 20.7% for field duplicate samples 596HW00104 and 596GW00104 (analyzed in SDG 28149B), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 Blank:

Sulfates were not detected in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 28149B. 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 1.3% for field duplicate samples 596HW00104 and 596GW00104 (analyzed in SDG 28149B), which was within the 30% QC limit for water samples. No action was taken.

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 Blank:

TDS was not detected in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field blanks, which were analyzed in SDG 28149B. 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 11.1% for field duplicate samples 596HW00104 and 596GW00104 (analyzed in SDG 28149B), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28149B CLP Organics and Inorganics

SAMPLES: 100GW00104, 590GW00104, 590GW01D04, 596GW00104, 596GW00204, 596GW00304, 596GW00404, 596GW01D04, 596GW04D04, GDEGW00804, GDEGW00804DL, GDEGW00904, GDEGW08D04, GDEGW09D04, GDEDW00804, GDEEW00804, GDEFW00804, GDETW00804, GDETW00904, GDETW08D04

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) for carbon disulfide (27.4%) and 1,1,2,2-tetrachloroethane (27.5%) exceeded the 25% QC limit for the standard analyzed on 1/14/97 at 11:02 on instrument N. All results for these compounds in associated samples GDEGW00904 and GDEGW09D04, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Difference (%D) for 2-hexanone (29.4%) exceeded the 25% QC limit for the standard analyzed on 1/15/97 on instrument N. The non-detect result for this compound in associated sample GDEGW00804 was flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

Trip Blanks:

There were no positive detections in the three trip blanks analyzed in this SDG. No action was taken.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed for this SDG. All Percent Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

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 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) was 39.2% for 2-methyl-4,6-dinitrophenol in the standards analyzed on 1/20/97 on instrument T. There were no detections of this compound in the associated samples. No action was taken.

Continuing Calibration:

The Percent Difference (%D) for 2,4-dinitrophenol was 29.1% for the standard analyzed on 1/22/97 at 11:40 on instrument T, which exceeded the 25% QC limit. The only associated sample for this calibration was dilution sample GDEGW00804DL. No action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

TIC's:

TIC's were not detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 25% for terphenyl-d14 in sample GDEGW00804, which was below the 33-141% QC limits. Since only one surrogate was outside QC limits in the base/neutral fraction, no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. Two Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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):

The concentration of bis(2-ethylhexyl)phthalate in sample GDEGW00804 exceeded the linear standard calibration range. The dilution result for this compound in sample GDEGW00804DL was transferred to the original sample data on the spreadsheets by the validator. All other CRQL criteria were met, so no further 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 without qualification.

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:

The Percent Relative Standard Deviations (%RSD's) for alpha-BHC (22.6%) and 4,4'-DDE (24.8%) exceeded the 20% QC limit for the standards analyzed on the secondary column on 1/16/97. Since only two results exceeded the QC limit with %RSD's less than 30%, no action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on the primary column on 1/16/97 at 15:59 for the following compounds:

beta-BHC	26.4%
gamma-BHC	32.0%
delta-BHC	30.8%
endosulfan I	33.7%
endosulfan II	50.1%
endrin ketone	53.7%
endrin aldehyde	30.9%

All results for these compounds in associated sample GDEGW00804, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) for endrin ketone (25.9%) and endrin aldehyde (31.3%) exceeded the 25% QC limit for the standards analyzed on the primary column on 1/17/97 at 03:27. The non-detect results for these two compounds in associated samples GDEGW00904 and GDEGW09D04 were flagged as estimated (UJ).

The Percent Difference (%D) was 25.8% for 4,4'-DDE in the standard analyzed on the secondary column on 1/21/97 at 09:21, which exceeded the 25% QC limit. The non-detect result for this compound in associated sample GDEGW08D04 was flagged as estimated (UJ).

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. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check data was not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Levell
CCB1	antimony	4.20 ug/L	21.0 ug/L
FB	beryllium	0.31 ug/L	1.55 ug/L
PBW	calcium	264 ug/L	1320 ug/L
ERB	chromium	1.50 ug/L	7.50 ug/L
ERB	mercury	0.43 ug/L	2.15 ug/L
FB	nickel	1.30 ug/L	6.50 ug/L
CCB7	selenium	3.90 ug/L	19.5 ug/L
CCB3	silver	1.90 ug/L	9.50 ug/L
PBW	sodium	516 ug/L	2580 ug/L
DWB	tin	2.70 ug/L	13.5 ug/L
PBW	zinc	47.3 ug/L	237 ug/L
DWB	cyanide	7.00 ug/L	35.0 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank GDEDW00804,
ERB = Equipment Rinsate Blank GDEEW00804, FB = Field Blank GDEFW00804
PBW = Preparation 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, 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB6	calcium	-87.1 ug/L	436 ug/L
PBW	iron	-32.2 ug/L	161 ug/L
CCB10	lead	-1.80 ug/L	9.00 ug/L
PBW	magnesium	-91.6 ug/L	458 ug/L
CCB11	selenium	-3.10 ug/L	15.5 ug/L
CCB10	silver	-1.30 ug/L	6.50 ug/L
CCB11	thallium	-3.70 ug/L	18.5 ug/L
PBW	vanadium	-0.62 ug/L	3.10 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 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:

antimony	4 ug/L
arsenic	4 ug/L
barium	1 ug/L
cadmium	3 ug/L
chromium	2 ug/L
cobalt	1 ug/L
copper	4 ug/L
lead	6 ug/L
manganese	1 ug/L
nickel	2 ug/L
selenium	10 ug/L
thallium	6 ug/L
tin	4 ug/L
vanadium	1 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 in ICS Solution A at absolute concentrations greater than the IDL for the following analytes:

arsenic	-3 ug/L
cadmium	-2 ug/L
copper	-4 ug/L
lead	-3 ug/L
manganese	-1 ug/L
selenium	-5 ug/L
vanadium	-1 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:

All Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples 596GW00104 and 596HW00104 (analyzed in SDG 28149A) were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	596HW00104, ug/L	596GW00104, ug/L	RPD
arsenic	16.5	15.0	9.5%
barium	21.3	20.0	6.3%
calcium	92300	88000	4.8%
iron	12800	12300	4.0%
magnesium	16200	15200	6.4%
manganese	263	247	6.3%
potassium	10600	9790	7.9%
sodium	73900	70000	5.4%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 required.

Deionized Water, Equipment Rinsate and Field Blanks:

Chlorides were not detected in the equipment rinsate and field blanks. Chlorides were detected at 0.23 mg/L in deionized water blank GDEDW00804. Since the detections of chloride in the associated samples were greater than 5X this amount, no 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 20.7% for field duplicate samples 596GW00104 and 596HW00104 (analyzed in SDG 28149A), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 1.3% for field duplicate samples 596GW00104 and 596HW00104 (analyzed in SDG 28149A), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 11.1% for field duplicate samples 596GW00104 and 596HW00104 (analyzed in SDG 28149A), which was within the 30% QC limit for water samples. No action was taken.

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:	0199
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / IV
EPA METHOD:	EPA SOW 3-90 / SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28179A (Level IV) 28179B (Level III)

SAMPLES:

SDG 28179A (Level IV):

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB	Total Metals
GDEHW04D04	28180.01	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEHW04D04	28180.01	Water	X	X	X	X

SDG 28179B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEGW01D04	28179.04	Water	X	X	X	X
GDEGW03D04	28179.05	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEGW04D04	28179.06	Water	X	X	X	X
GDEGW05D04	28196.05	Water	X	X	X	X
GDEGW05D04DL	28196.05DL	Water		+		
GDEGW06D04	28196.06	Water	X	X	X	X
097GW00104	28179.02	Water				X
102GW00104	28179.01	Water				X
583GW00104	28196.01	Water				X
583GW00204	28196.02	Water				X
583GW00304	28196.04	Water				X
583GW02D04	28196.03	Water				X
586GW00104	28179.03	Water				X
GDETW04D04	28179.07	Water	X			
GDETW06D04	28196.07	Water	X			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEGW01D04	28179.04	Water	X	X	X	X
GDEGW03D04	28179.05	Water	X	X	X	X
GDEGW04D04	28179.06	Water	X	X	X	X
GDEGW05D04	28196.05	Water	X	X	X	X
GDEGW06D04	28196.06	Water	X	X	X	X
097GW00104	28179.02	Water		X	X	X
102GW00104	28179.01	Water		X	X	X
583GW00104	28196.01	Water		X	X	X
583GW00204	28196.02	Water		X	X	X
583GW00304	28196.04	Water		X	X	X
583GW02D04	28196.03	Water		X	X	X
586GW00104	28179.03	Water		X	X	X

DL = DILUTION, H = FIELD DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28179A Appendix IX Organics & Inorganics

SAMPLE: GDEHW04D04

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 1/13/97 on instrument N for the following compounds:

trans-1,4-dichloro-2-butene	0.046
acetonitrile	0.036
isobutyl alcohol	0.007
1,4-dioxane	0.002

The results for these compounds in associated sample GDEHW04D04, which consisted entirely of non-detects, were rejected (R).

The Percent Relative Standard Deviation (%RSD) for the standards analyzed on 1/13/97 on instrument N exceeded the 30% QC limit for 1,4-dioxane (60.9%). The result for this compound in the associated sample was previously rejected, so no further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRF's) for the standards analyzed on 1/21/97 at 09:59 on instrument N were below the 0.050 QC limit for the following compounds:

acetonitrile	0.035
isobutyl alcohol	0.009
1,4-dioxane	0.003

The results for these compounds in the associated sample 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 1/21/97 at 09:59 on instrument N for the following compounds:

acetone	40.9%
vinyl acetate	27.5%
acrolein	34.1%
trans-1,4-dichloro-2-butene	43.5%
isobutyl alcohol	28.6%
1,4-dioxane	50.0%

The non-detect results for trans-1,4-dichloro-2-butene, isobutyl alcohol and 1,4-dioxane in the associated sample were previously rejected. The results for the other compounds in associated sample GDEHW04D04, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks in this SDG. No action was required.

Trip Blanks:

There were no positive detections in the trip blanks, which were analyzed SDG 28179B. No action was required.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. 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 required.

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 trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample GDEHW04D04 based on 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, 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 1/16/97 on instrument A for the following compounds:

2-picoline	30.5%
acetophenone	30.1%
m-cresol	31.9%
n-nitrosomorpholine	30.5%

n-nitroso-piperidine	35.2%
o,o,o-triethyl phosphorothionate	31.2%
2,6-dichlorophenol	34.4%
hexachloropropene	34.8%
n-nitroso-di-n-butylamine	32.2%
1,2,4,5-tetrachlorobenzene	39.0%
safrole	35.0%
isosafrole	35.9%
1,4-naphthoquinone	35.6%
1,3-dinitrobenzene	40.3%
pentachlorobenzene	37.3%
1-naphthylamine	37.1%
4-nitroquinoline-1-oxide	35.0%
2-naphthylamine	33.3%
thionazin	36.8%
diphenylamine	33.8%
sulfotepp	37.1%
1,3,5-trinitrobenzene	31.2%
phorate	36.0%
phenacetin	38.7%
diallate	36.6%
dimethoate	35.9%
4-aminobiphenyl	34.1%
pronamide	40.4%
pentachloronitrobenzene	33.3%
disulfoton	32.5%
methyl parathion	38.6%
parathion	34.9%
chlorobenzilate	30.1%
kepone	44.9%
famphur	57.6%
7,12-dimethylbenz(a)anthracene	47.2%

These compounds were not detected in the associated sample. No action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 1/23/97 at 07:37 on instrument A for the following compounds:

2,6-dichlorophenol	49.8%
hexachloropropene	77.7%
1,2,4,5-tetrachlorobenzene	79.9%
pentachlorobenzene	59.7%
n-nitrosodimethylamine	37.7%
methyl methanesulfonate	31.7%
n-nitrosomethylethylamine	42.9%
n-nitrosodiethylamine	31.1%

ethyl methanesulfonate	44.2%
acetophenone	42.5%
n-nitrosopyrrolidine	40.8%
n-nitrosomorpholine	36.7%
o-toluidine	46.9%
n-nitroso-piperidine	53.9%
o,o,o-triethyl phosphorothionate	48.6%
n-nitrosodi-n-butylamine	42.9%
safrole	58.2%
isosafrole	58.2%
1,4-naphthoquinone	33.3%
1,3-dinitrobenzene	40.7%
1-naphthylamine	55.7%
2-naphthylamine	52.6%
thionazin	51.4%
phorate	46.2%
phenacetin	51.1%
dimethoate	50.6%
4-aminobiphenyl	52.5%
pronamide	55.9%
pentachloronitrobenzene	69.0%
disulfoton	42.3%
methyl parathion	47.2%
parathion	51.0%
isodrin	40.8%
3,3'-dimethylbenzidine	36.2%
m-cresol	31.1%
4-nitroquinoline-1-oxide	48.2%
diphenylamine	61.3%
sulfotepp	57.0%
kepone	44.7%
7,12-dimethylbenz(a)anthracene	66.6%
4-methylphenol	31.1%
p-phenylenediamine	58.1%
1,3,5-trinitrobenzene	32.9%
hexachlorophene	46.2%

The results for these compounds in associated sample GDEHW04D04, 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 required.

TIC's:

There were no TIC's detected in the method blank. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG, so no action was required.

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.

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 required.

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 1/21/97 at 02:52 on the primary column for heptachlor (27.2%). The non-detect result for this compound in associated sample GDEHW04D04 was flagged as estimated (UJ).

IV.) 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 required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

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 calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction in the 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):

All GPC criteria were met. No action was necessary.

XI.) Overall Assessment of Data/General:

All laboratory data were acceptable with 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:

Blank Type/ID#	Analyte	Max. Conc.	Action Limit
CCB1	antimony	4.70 ug/L	23.5 ug/L
PBW	barium	1.53 ug/L	7.65 ug/L
PBW	calcium	14.7 ug/L	73.5 ug/L
PBW	cobalt	0.97 ug/L	4.85 ug/L
ICB	thallium	4.70 ug/L	23.5 ug/L
ICB	tin	4.20 ug/L	21.0 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 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB4	arsenic	-3.70 ug/L	18.5 ug/L
CCB3	selenium	-3.10 ug/L	15.5 ug/L

CCB = Continuing Calibration Blank

The associated non-detect sample results for these two analytes 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:

antimony	7 ug/L
barium	1 ug/L
chromium	3 ug/L
nickel	1 ug/L
thallium	5 ug/L
tin	5 ug/L

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

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

copper	-1 ug/L
selenium	-8 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the 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) for calcium was 13.1% for serial dilution sample GDEHW04D04L, which exceeded the 10% QC limit. The positive result for this analyte in associated sample GDEHW04D04 was 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 required.

VIII.) Matrix Spike Recoveries:

Matrix Spike analysis was not performed in this SDG. No action was required.

IX.) Field Duplicates:

Field duplicate samples GDEHW04D04 and GDEGW04D04 (analyzed in SDG 28179B) were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEGW04D04, ug/L	GDEHW04D04, ug/L	RPD
aluminum	31.5	32.3	2.5%
barium	66.1	68.4	3.4%
calcium	226000	233000	3.1%
magnesium	267000	276000	3.3%
manganese	351	363	3.4%
potassium	41100	43000	4.5%
sodium	1700000	1730000	1.7%

None of the Relative Percent Differences (RPD's) exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 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.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides in field duplicate samples GDEGW04D04 (analyzed in SDG 28179B) and GDEHW04D04 was 34.9%, which exceeded the 30% QC limit for water samples. The positive results for chloride in these two samples were flagged as estimated (J).

VII.) 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:

There were no positive detections 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.) 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 not calculable for sulfates in field duplicate

samples GDEGW04D04 (analyzed in SDG 28179B) and GDEHW04D04. 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:

TDS 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.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS in field duplicate samples GDEGW04D04 (analyzed in SDG 28179B) and GDEHW04D04 was 0.1%, which was below 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 Laboratories of Oklahoma, Inc. - 28179B CLP Organics and Inorganics

SAMPLES: GDEGW01D04, GDEGW03D04, GDEGW04D04, GDEGW05D04, GDEGW05D04DL, GDEGW06D04, 097GW00104, 102GW00104, 583GW00104, 583GW00204, 583GW00304, 583GW02D04, 586GW00104, GDETW04D04, GDETW06D04

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:

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 1/20/97 at 11:28 on instrument N for bromoform (32.3%). The non-detect results for this compound in associated samples GDEGW05D04 and GDEGW06D04 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks for this SDG. No action was required.

Trip Blanks:

There were no positive detections in the trip blanks in this SDG. No action was required.

TIC's:

There were no TIC's detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this SDG, so no action was required.

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 required.

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) for the standards analyzed on 1/23/97 on instrument S exceeded the 30% QC limit for 2,6-dinitrotoluene. This compound was not detected in the associated samples, so 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 for this SDG. No action was required.

TIC's:

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

VII.) Laboratory Control Samples (LCS):

One LCS was analyzed for this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the SDG, so no action was required.

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):

The concentration of bis (2-ethylhexyl)phthlate in sample GDEGW05004 was greater than the instrument linear calibration range. The original result for this compound was replaced by the validator with the dilution result with appropriate flagging (D).

All other CRQL criteria were met, so no further 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 without qualification.

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 required.

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 1/21/97 at 02:52 on the primary column for heptachlor (27.2%). The non-detect results for this compound in associated samples GDEGW01D04, GDEGW03D04 and GDEGW04D04 were flagged as estimated (UJ).

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 required.

VI.) Laboratory Control Sample (LCS):

All LCS criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this SDG. No action was required.

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 calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction of the 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):

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:

Blank Type/ID#	Analyte	Max. Conc.	Action Limit
PBW	antimony	4.70 ug/L	23.5 ug/L
PBW	barium	1.53 ug/L	7.65 ug/L
PBW	calcium	14.7 ug/L	73.5 ug/L
PBW	cobalt	0.97 ug/L	4.85 ug/L
ICB	thallium	4.70 ug/L	23.5 ug/L
ICB	tin	4.20 ug/L	21.0 ug/L

ICB = Initial 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB2	aluminum	-21.0 ug/L	105 ug/L
CCB4	arsenic	-3.70 ug/L	18.5 ug/L
ICB	nickel	-2.00 ug/L	10.0 ug/L
CCB3	selenium	-3.10 ug/L	15.5 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank

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:

antimony	6 ug/L
arsenic	3 ug/L
barium	1 ug/L
beryllium	1 ug/L

cadmium	1 ug/L
chromium	3 ug/L
lead	2 ug/L
thallium	5 ug/L
tin	5 ug/L
vanadium	1 ug/L

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

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

copper	-1 ug/L
cobalt	-1 ug/L
selenium	-8 ug/L

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

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed in this SDG. No action was required.

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 required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this SDG. No action was required.

IX.) Field Duplicates:

Field duplicate samples GDEHW04D04 (analyzed in SDG 28179A) and GDEGW04D04 were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEGW04D04, ug/L	GDEHW04D04, ug/L	RPD
aluminum	31.5	32.3	2.5%
barium	66.1	68.4	3.4%
calcium	226000	233000	3.1%
magnesium	267000	276000	3.3%
manganese	351	363	3.4%

Analyte	GDEGW04D04, ug/L	GDEHW04D04, ug/L	RPD
potassium	41100	43000	4.5%
sodium	1700000	1730000	1.7%

None of the Relative Percent Differences (RPD's) exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 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. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for field duplicate samples GDEGW04D04 and GDEHW04D04 (analyzed in SDG 28179A) was 34.9%, which exceeded the 30% QC limit for water samples. The positive results for chlorides in these two samples were flagged as estimated (J).

VII.) 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:

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. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) was not calculable for sulfates in field duplicate samples GDEGW04D04 and GDEHW04D04 (analyzed in SDG 28179A). 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. No action was required.

VI.) Field Duplicates:

The calculable Relative Percent Difference (RPD) for field duplicate samples GDEGW04D04 and GDEHW04D04 (analyzed in SDG 28179A) was 0.1%, which was less than 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:	0201
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHOD:	EPA SOW 3-90 / SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28210A (Level IV, Appendix IX) 28210B (Level III)

SAMPLES:

SDG 28210A (Level IV):

Client Sample #	Lab Sample #	Matrix	Total Metals	Chlorides	Sulfates	TDS
145HW00204*	28211-01	Water	X	X	X	X
580HW00204*	28236-01	Water	X	X	X	X
145HW00204MD	28211-01MD	Water				+
580HW00204MD	28236-01MD	Water				+

* = Corresponding samples 145GW00204 and 580GW00204 were analyzed in SDG 28210B.

HW = FIELD DUPLICATE, MD = MATRIX DUPLICATE

SDG 28210B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Cyanide
GDEGW01004	28235-07	Water	X	X	X	X
GDEGW01104	28210-07	Water	X	X	X	X
GDEGW10D04	28235-08	Water	X	X	X	X
GDEGW11D04	28210-08	Water	X	X	X	X
580DW00104	28236-04	Water	X	X	X	X
580EW00104	28236-05	Water	X	X	X	X
580FW00104	28236-06	Water	X	X	X	X
GDETW01004	28235-09	Water	X			
GDETW11D04	28210-09	Water	X			
145GW01D04MS	28210-03MS	Water				+
145GW01D04MSD	28210-04MSD	Water				+

Client Sample #	Lab Sample #	Matrix	Total Metals	Chlorides	Sulfates	TDS
145GW00104	28210-01	Water	X	X	X	X
145GW00204*	28210-05	Water	X	X	X	X
145GW00304	28210-06	Water	X	X	X	X
145GW01D04	28210-02	Water	X	X	X	
580GW00104	28235-01	Water	X	X	X	X
580GW00204*	28235-03	Water	X	X	X	X
580GW01D04	28235-02	Water	X	X	X	X
GDEGW01004	28235-07	Water	X	X	X	X
GDEGW01104	28210-07	Water	X	X	X	X
GDEGW10D04	28235-08	Water	X	X	X	X
GDEGW11D04	28210-08	Water	X	X	X	X
580DW00104	28236.04	Water	X	X	X	X
580EW00104	28236-05	Water	X	X	X	X
580FW00104	28236-06	Water	X	X	X	X
145GW01D04MS	28210-03MS	Water	+	+	+	
145GW01D04MSD	28210-04MSD	Water	+	+	+	

* = Field duplicate samples 145HW00204 and 580HW00204 were analyzed in SDG 28210A.
+ = Non-billable analysis

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28210A Appendix IX, CLP Inorganics

SAMPLES: 145HW00204, 580HW00204, 145HW00204MD, 580HW00204MD

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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
DWB	aluminum	19.1 ug/L	95.5 ug/L
FB	antimony	2.60 ug/L	13.0 ug/L
ICB	arsenic	2.80 ug/L	14.0 ug/L
CCB2	beryllium	0.60 ug/L	3.00 ug/L
PBW	chromium	1.35 ug/L	6.75 ug/L
PBW	silver	1.25 ug/L	6.25 ug/L
ERB	thallium	4.00 ug/L	20.0 ug/L
ERB	tin	10.7 ug/L	53.5 ug/L
ERB	zinc	12.8 ug/L	64.0 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
DWB = Deionized Water Blank (580DW00104),
ERB = Equipment Rinsate Blank (580EW00104), FB = Field Blank (580FW00104),
PBW = Preparation Blank (Water)

Field Blanks (DWB, ERB and FB) were analyzed in SDG 28210B. 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB2	aluminum	-21.0 ug/L	105 ug/L
PBW	lead	-1.77 ug/L	8.85 ug/L
PBW	nickel	-2.25 ug/L	11.3 ug/L
CCB4	thallium	-2.90 ug/L	14.5 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 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:

antimony	9 ug/L
arsenic	3 ug/L
barium	1 ug/L
beryllium	1 ug/L
chromium	3 ug/L
lead	2 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 samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

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

copper	-1 ug/L
nickel	-1 ug/L
selenium	-4 ug/L
potassium	-1200 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:

All Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples, 145HW00204 / 145GW00204 (analyzed in SDG 28210B) and 580HW00204 / 580GW00204 (analyzed in SDG 28210B), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	145HW00204, ug/L	145GW00204, ug/L	RPD
calcium	150000	161000	7.1%
iron	4760	5190	8.6%
magnesium	15700	17100	8.5%
manganese	183	200	8.9%
potassium	12600	13700	7.9%
sodium	46800	48100	5.4%

Analyte	580HW00204, ug/L	580GW00204, ug/L	RPD
calcium	14600	14800	1.4%
iron	10500	10600	0.9%
magnesium	5650	5720	1.2%
manganese	120	122	1.7%
sodium	46800	48100	2.7%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides were not detected in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Chlorides were not detected in the three field blanks, which were analyzed in SDG 28210B. 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 2.2% for field duplicate samples 145HW00204 and 145GW00204 (analyzed in SDG 28210B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 8.1% for field duplicate samples 580HW00204 and 580GW00204 (analyzed in SDG 28210B), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 Blank:

Sulfates were not detected in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 28210B. 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0.8% for field duplicate samples 145HW00204 and 145GW00204 (analyzed in SDG 28210B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0.9% for field duplicate samples 580HW00204 and 580GW00204 (analyzed in SDG 28210B), which was within the 30% QC limit for water samples. No action was taken.

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 Blank:

TDS was not detected in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 44 mg/L in deionized water blank 590DW00104, 44 ug/L in equipment rinsate blank 580EW00104 and 40 mg/L in field blank 580FW00104, which were analyzed in SDG 28210. Since the TDS detections in the two SDG samples were greater than 5X the blank amounts, 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:

All Duplicate Sample Analysis criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 4.9% for field duplicate samples 145HW00204 and 145GW00204 (analyzed in SDG 28210B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for TDS was 20.4% for field duplicate samples 580HW00204 and 580GW00204 (analyzed in SDG 28210B), which was within the 30% QC limit for water samples. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28210B CLP Organics and Inorganics

SAMPLES: 145GW00104, 145GW00204, 145GW00304, 145GW01D04, 580GW00104, 580GW00204, 580GW01D04, GDEGW01004, GDEGW01104, GDEGW10D04, GDEGW11D04, 580DW00104, 580EW00104, 580FW00104, GDETW01004, GDETW11D04, 145GW01D04MS, 145GW01D04MSD

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) was 32.3% for bromoform in the standard analyzed on 1/20/97 at 11:28 on instrument N. The non-detect results for bromoform in associated samples GDEGW01104 and GDEGW11D04 were flagged as estimated (UJ).

The Percent Difference (%D) was 33.6% for vinyl acetate in the standard analyzed on 1/23/97 at 09:04 on instrument N. The non-detect results for vinyl acetate in associated samples GDEGW01004 and GDEGW10D04 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

Chloroform was detected at 3 ug/L each in deionized water blank 580DW00104, equipment rinsate blank

580EW00104 and field blank 580FW00104. Since chloroform was not detected in the SDG samples, no action was required.

Trip Blanks:

There were no positive detections in the two trip blanks in this SDG. No action was taken.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All Percent Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

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 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) was 44.7% for benzoic acid in the standards analyzed on 1/22/97 on instrument V. Benzoic acid was not detected in the associated samples. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC for the standards analyzed on 1/27/97 at 11:41 on instrument V for the following compounds:

benzoic acid	56.2%
3,3'-dichlorobenzidine	42.5%
indeno(1,2,3-cd)pyrene	41.4%
dibenz(a,h)anthracene	42.3%
benzo(g,h,i)perylene	48.2%

The results for these compounds in associated samples GDEGW01004 and GDEGW10D04, 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, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

TIC's:

3-Penten-2-ol was detected in method blank SBLK1 at sufficient concentration, using the 5X Blank Rule, to elimination its detections in samples GDEGW01104 and GDEGW11D04. Blank qualification was not required for TIC's, so no action was taken

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 130% for 2,4,6-tribromophenol in sample GDEGW11D04, which exceeded the 10-123% QC limits. Since only one surrogate was outside QC limits in the acid compound fraction, no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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.

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:

The Percent Relative Standard Deviation (%RSD) was 21.8% for gamma-chlordane in the standards analyzed on the secondary column on 1/27/97, which exceeded the 20% QC limit. Since only one compound exceeded the QC limit, no action was required.

Continuing Calibration:

The Percent Difference (%D) for endosulfan I was 28.1% for the standards analyzed on the secondary column on 1/27/97 at 18:48, which exceeded the 25% QC limit. The non-detect results for this compound in associated samples GDEGW01004 and GDEGW10D04 were flagged as estimated (UJ).

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. 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 by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
DWB	aluminum	19.1 ug/L	95.5 ug/L
FB	antimony	2.60 ug/L	13.0 ug/L
ICB	arsenic	2.80 ug/L	14.0 ug/L
CCB2	beryllium	0.60 ug/L	3.00 ug/L
PBW	chromium	1.35 ug/L	6.75 ug/L
PBW	silver	1.25 ug/L	6.25 ug/L

Blank Type/ID#	Analyte	Max. Conc.	Action Level
ERB	thallium	4.00 ug/L	20.0 ug/L
ERB	tin	10.7 ug/L	53.5 ug/L
ERB	zinc	12.8 ug/L	64.0 ug/L
ERB	cyanide	5.90 ug/L	29.5 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
DWB = Deionized Water Blank (580DW00104),
ERB = Equipment Rinsate Blank (580EW00104), FB = Field Blank (580FW00104),
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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB2	aluminum	-21.0 ug/L	105 ug/L
PBW	lead	-1.77 ug/L	8.85 ug/L
PBW	nickel	-2.25 ug/L	11.3 ug/L
CCB4	thallium	-2.90 ug/L	14.5 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 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:

antimony	9 ug/L
arsenic	3 ug/L
barium	1 ug/L
beryllium	1 ug/L
chromium	3 ug/L
lead	2 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 samples at a concentration comparable to or greater than the amount in Solution A, no action was required.

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

copper	-1 ug/L
nickel	-1 ug/L
selenium	-4 ug/L
potassium	-1200 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:

All Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of potassium were 41.3% and 37.3%, respectively, in spiked samples 145GW01D04MS and 145GW01D04MSD, which were below the 75-125% QC limits. All positive and non-detect results for this analyte in the SDG samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

Two sets of field duplicate samples, 145HW00204 (analyzed in SDG 28210A) / 145GW00204 and 580HW00204 (analyzed in SDG 28210A) / 580GW00204, were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	145HW00204, ug/L	145GW00204, ug/L	RPD
calcium	150000	161000	7.1%
iron	4760	5190	8.6%
magnesium	15700	17100	8.5%
manganese	183	200	8.9%
potassium	12600	13700	7.9%
sodium	46800	48100	5.4%

Analyte	580HW00204, ug/L	580GW00204, ug/L	RPD
calcium	14600	14800	1.4%
iron	10500	10600	0.9%
magnesium	5650	5720	1.2%

Analyte	580HW00204, ug/L	580GW00204, ug/L	RPD
manganese	120	122	1.7%
sodium	46800	48100	2.7%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 detected at 2.0 mg/L in method blank CHLBLK2. The detection of chlorides in associated sample 580GW00104, which was less than 5X the blank amount, was flagged as undetected (U) with the detection limit being raised to the amount of contamination in the sample.

Deionized Water, Equipment Rinsate and Field Blanks:

Chlorides were not detected in the three field blanks. No 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):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 2.2% for field duplicate samples 145GW00204 and 145HW00204 (analyzed in SDG 28210A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 8.1% for field duplicate samples 580GW00204 and 580HW00204 (analyzed in SDG 28210A), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with one qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field 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 criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0.8% for field duplicate samples 145GW00204 and 145HW00204 (analyzed in SDG 28210A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0.9% for field duplicate samples 580GW00204 and 580HW00204 (analyzed in SDG 28210A), which was within the 30% QC limit for water samples. No action was taken.

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 Blank:

TDS was not detected in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 44 mg/L each in deionized water blank 580DW00104 and equipment rinsate blank 580EW00101. The positive detection of TDS in sample 580GW00104, which was equal to 5X the blank amounts, was flagged as undetected (U) with the detection limit being raised to the amount of contamination in the sample. TDS was not detected in the field blank. No further 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 4.9% for field duplicate samples 145GW00204 and 145HW00204 (analyzed in SDG 28210A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for TDS was 20.4% for field duplicate samples 580GW00204 and 580HW00204 (analyzed in SDG 28210A), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable with one 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:	0202
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVEL:	EPA Level III
EPA METHODS:	EPA SOW 3-90 / SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBER:	28253 (Level III)

SAMPLES:

SDG 28253 (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
083GW00104	28281.03	Water				X
556GW01D04	28253.02	Water				X
66GW00104	28253.01	Water				X
574GW00104	28262.05	Water				X
574GW00204	28281.01	Water				X
574GW00304	28281.02	Water				X
574GW01D04	28262.06	Water				X
576GW00104	28262.01	Water	X	X		X
576GW00204	28253.03	Water	X	X		X
576GW02D04	28262.04	Water	X	X		X
GDEGW00704	28253.04	Water	X	X	X	X
GDEGW01204	28262.10	Water	X	X	X	X
GDEGW01304	28281.04	Water	X	X	X	X
GDEGW07D04	28253.05	Water	X	X	X	X
GDEGW12D04	28262.07	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEGW13D04	28281.05	Water	X	X	X	X
GDETW00704	28253.06	Water	X			
GDETW01204	28262.11	Water	X			
GDETW01304	28281.06	Water	X			
576GW00104MS	28262.01MS	Water	+	+		+
576GW00104MD	28262.01MD	Water				+
576GW00104MSD	28262.01MSD	Water	+	+		
GDEGW12D04MS	28262.07MS	Water	+	+	+	+
GDEGW12D04MD	28262.07MD	Water				+
GDEGW12D04MSD	28262.07MSD	Water	+	+	+	

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
083GW00104	28281.03	Water		X	X	X
556GW01D04	28253.02	Water		X	X	X
566GW00104	28253.01	Water		X	X	X
574GW00104	28262.05	Water		X	X	X
574GW00204	28281.01	Water		X	X	X
574GW00304	28281.02	Water		X	X	X
574GW01D04	28262.06	Water		X	X	X
576GW00104	28262.01	Water		X	X	X
GDEGW00704	28253.04	Water	X	X	X	X
GDEGW01204	28262.10	Water	X	X	X	X
GDEGW01304	28281.04	Water	X	X	X	X
GDEGW07D04	28253.05	Water	X	X	X	X
GDEGW12D04	28262.07	Water	X	X	X	X
GDEGW13D04	28281.05	Water	X	X	X	X
576GW00104MS	28262.01MS	Water	+	+	+	
576GW00104MD	28262.01MD	Water	+			
576GW00104MSD	28262.01MSD	Water		+	+	
GDEGW12D04MS	28262.07MS	Water	+	+	+	
GDEGW12D04MD	28262.07MD	Water	+			
GDEGW12D04MSD	28262.07MSD	Water		+	+	

+ = Non-billable Quality Control sample

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: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28253 CLP Organics and Inorganics

SAMPLES: 083GW00104, 556GW01D04, 566GW00104, 574GW00104, 574GW00204, 574GW00304, 574GW01D04, 576GW00104, 576GW00204, 576GW02D04, GDEGW00704, GDEGW01204, GDEGW01304, GDEGW07D04, GDEGW12D04, GDEGW13D04, GDETW00704, GDETW01204, GDETW01304, 576GW00104MD, 576GW00104MS, 576GW00104MSD, GDEGW12D04MD, GDEGW12D04MS, GDEGW12D04MSD

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:

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 1/24/97 at 09:22 on instrument N for vinyl acetate (37.0%). The results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 576GW00204, GDEGW00704, GDEGW07D04, 576GW00104, 576GW02D04 and GDEGW12D04.

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 1/27/97 at 15:44 on instrument N for vinyl acetate (31.6%). The results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDEGW01204, GDEGW01304 and GDEGW13D04.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was required.

Trip Blanks:

There were no positive detections in the trip blanks. No action was required.

TIC's:

TIC's were not detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD) was 22% for 1,1-dichloroethene in spiked samples 576GW00104MS and 576GW00104MSD, which exceeded the 14% QC limit. The non-detect result for this compound in unspiked sample 576GW00104 was flagged as estimated (UJ).

The Percent Recovery (%R) of 1,1-dichloroethene in spiked sample 576GW00104MSD was 58%, which exceeded the 61-145% QC limit. The result for this compound in the unspiked sample was previously flagged based on a high RPD. No further action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG, so no action was required.

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 required.

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 required.

Continuing Calibration:

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 1/29/97 at 09:55 on instrument S for 2,4-dinitrophenol (25.7%). The results for this compound in associated samples 576GW02D04, GDEGW12D04 and GDEGW01204, which consisted 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.

TIC's:

There were no TIC's detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

The Percent Recovery (%R) of 2-fluorophenol was 14% in sample 576GW02D04, which was below the 21-100% QC limits. Since only one acid fraction recovery was outside the QC limits, no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recovery (%R) of 4-nitrophenol in spiked sample GDEGW12D04MSD was 90%, which exceeded the 10-80% QC limits. Since this compound was not detected in unspiked sample GDEGW12D04, no action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG, so no action was required.

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.

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 required.

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) for gamma-chlordane was 21.7% on the primary column for the standards analyzed on 1/27/97, which exceeded the 20% QC limit. Since only one compound exceeded the QC limit with a %RSD of less than 30%, no action was required.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 1/28/97 at 03:11 on both the primary and secondary columns for the following compounds:

Compound	Primary Column %D	Secondary Column %D
alpha-BHC	51.7	50.8
gamma-BHC	51.4	48.9
heptachlor	47.2	47.1
endosulfan I	47.7	52.7
dieldrin	48.0	50.4
endrin	43.5	46.3
4,4'-DDD	47.7	50.3
4,4'-DDT	49.9	50.9
methoxychlor	45.7	43.9

The results for these compounds in associated samples GDEGW01304 and GDEGW12D04, 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 1/29/97 at 03:41 on both the primary and secondary columns for the following compounds:

Compound	Primary Column %D	Secondary Column %D
beta-BHC	46.8	44.9
delta-BHC	49.4	48.9
aldrin	49.3	45.4
heptachlor epoxide	44.1	46.1
4,4'-DDE	47.8	46.4
endosulfan II	46.4	45.3
endosulfan sulfate	45.6	51.8
endrin ketone	45.9	48.7
endrin aldehyde	50.2	48.4
alpha-chlordane	44.3	44.3
gamma-chlordane	46.0	29.6

The results for these compounds in associated samples GDEGW01304 and GDEGW12D04, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 1/27/97 at 18:48 on the secondary column for endosulfan I (28.1%). The non-detect results for this compound in associated samples GDEGW00704 and GDEGW07D04 were flagged as estimated (UJ).

The Percent Difference (%D) exceeded the 25% QC limit for the standard analyzed on 1/28/97 at 09:50 on the secondary column for endrin (25.6%). The non-detect results for this compound in associated samples GDEGW01204 and GDEGW12D04 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:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Sample (LCS):

All LCS 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.) 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 analyzed 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 cleanup was not required in 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:

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:

Blank ID	Analyte	Max. Conc.	Action Level
CCB4	antimony	2.50 ug/L	12.5 ug/L
CCB4	arsenic	2.80 ug/L	14.0 ug/L
PBW3	calcium	28.0 ug/L	140 ug/L
PBW1	chromium	0.81 ug/L	4.00 ug/L
PBW1	tin	11.5 ug/L	57.5 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).

There were no analytes having negative results with absolute values greater than the IDL in this SDG. 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	9 ug/L
barium	2 ug/L
chromium	3 ug/L
thallium	7 ug/L
vanadium	1 ug/L
zinc	7 ug/L

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

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

cadmium	-1 ug/L
copper	-1 ug/L
selenium	-6 ug/L

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

V.) ICP Serial Dilution Analysis:

The Percent Difference (%D) of calcium was 12.6% for the dilution analysis in this SDG, which exceeded the 10% QC limit. All positive results for this compound in the associated 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:

All Duplicate Sample Analysis criteria were met. No action was required.

VIII.) Matrix Spike Recoveries:

The Percent Recoveries (%R's) of magnesium (73.5%) and manganese (65.5%) were below the 75-125% QC limits for spiked sample 576GW00104MS. All positive and non-detect results for these two analytes in the associated samples were flagged as estimated (J) and (UJ).

The Percent Recoveries (%R's) of manganese (72.5%) and nickel (74.5%) were below the 75-125% QC limits for spiked sample GDEGW12D04MS. All positive and non-detect results for these two analytes in the associated samples were flagged as estimated (J) and (UJ).

IX.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG. 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

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 criteria were met. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 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 criteria were met. No action was required.

VI.) Field Duplicates:

There were no field duplicate samples analyzed in this SDG. 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:

TDS 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.) 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:

There were no field duplicate samples analyzed in this 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

(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:	0204
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHOD:	EPA SOW 3-90 / SW-846
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, Organotin, Total Metals, Cyanide, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28301A (Level IV, Appendix IX) 28301B (Level III)

SAMPLES:

SDG 28301A (Level IV):

Client Sample #	Lab Sample #	Matrix	Total Metals	Chlorides	Sulfates	TDS
084HW00204*	28315-01	Water	X	X	X	X
573HW00104*	28332-01	Water	X	X	X	X

* = Corresponding samples 084GW00204 and 573GW00104 were analyzed in SDG 28301B.

HW = FIELD DUPLICATE

SDG 28301B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Organotin
172GW00104	28301-02	Water	X	X		
172GW00104DL	28301-02DL	Water	+			
172GW00204	28314-03	Water	X	X		X
172GW02D04	28301-03	Water	X	X		

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Organotin
GDEGW01404	28314-06	Water	X	X	X	
GDEGW01504	28314-04	Water	X	X	X	
GDEGW01804	28331-03	Water	X	X	X	
GDEGW01804RE	28331-03RE	Water			+	
GDEGW14D04	28301-04	Water	X	X	X	
GDEGW15D04	28314-05	Water	X	X	X	
GDEGW18D04	28331-04	Water	X	X	X	
GDEDW14D04	28301-05	Water	X	X	X	X
GDEEW14D04	28301-06	Water	X	X	X	X
GDEFW14D04	28301-07	Water	X	X	X	X
GDEFW14D04RE	28301-07RE	Water				+
GDETW01404	28314-07	Water	X			
GDETW01804	28311-05	Water	X			
GDETW14D04	28301-08	Water	X			

Client Sample #	Lab Sample #	Matrix	Total Metals	Cyanide	Chlorides	Sulfates	TDS
083GW00204	28301-01	Water	X		X	X	X
084GW00104	28314-01	Water	X		X	X	X
084GW00204*	28314-02	Water	X		X	X	X
172GW00104	28301-02	Water	X		X	X	X
172GW00204	28314-03	Water	X		X	X	X
172GW02D04	28301-03	Water	X		X	X	X
573GW00104*	28331-01	Water	X		X	X	X
573GW01D04	28331-02	Water	X		X	X	X
GDEGW01404	28314-06	Water	X	X	X	X	X
GDEGW01504	28314-04	Water	X	X	X	X	X
GDEGW01804	28331-03	Water	X	X	X	X	X
GDEGW14D04	28301-04	Water	X	X	X	X	X
GDEGW15D04	28314-05	Water	X	X	X	X	X
GDEGW18D04	28331-04	Water	X	X	X	X	X
GDEDW14D04	28301-05	Water	X	X	X	X	X
GDEEW14D04	28301-06	Water	X	X	X	X	X
GDEFW14D04	28301-07	Water	X	X	X	X	X

* = Corresponding samples 084HW00204 and 573HW00104 were analyzed in SDG 28301A.
+ = Non-billable analysis

DL = DILUTION, DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, RE = REANALYSIS, TW = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28301A Appendix IX, CLP Inorganics

SAMPLES: 084HW00204, 573HW00104

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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB2	antimony	2.80 ug/L	14.0 ug/L
FB	beryllium	0.34 ug/L	1.70 ug/L
DWB	calcium	25.0 ug/L	125 ug/L
DWB	copper	2.00 ug/L	10.0 ug/L
DWB	thallium	4.30 ug/L	21.5 ug/L
FB	tin	30.6 ug/L	153 ug/L
DWB	zinc	8.60 ug/L	43.0 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized WaterBlank (GDEDW14D04), FB = Field Blank (GDEFW14D04)

The field and deionized water blanks were analyzed in SDG 28301B. 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, deionized water or field 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
barium	2 ug/L
cadmium	1 ug/L
chromium	3 ug/L
lead	2 ug/L
selenium	5 ug/L
thallium	6 ug/L
tin	7 ug/L
vanadium	1 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.

A negative result for zinc (-9 ug/L) was observed 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:

All Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples, 084HW00204 / 084GW00204 (analyzed in SDG 28301B) and 573HW00104 / 573GW00104 (analyzed in SDG 28301B), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	084HW00204, ug/L	084GW00204, ug/L	RPD
arsenic	37.2	38.4	3.2%
calcium	14300	14900	4.1%
iron	1760	1840	4.4%
manganese	164	171	4.2%
sodium	30100	30400	1.0%

Analyte	573HW00104, ug/L	573GW00104, ug/L	RPD
calcium	75500	74300	1.6%
iron	3690	3650	1.1%
magnesium	14800	14700	0.7%
manganese	211	208	1.4%
potassium	9970	9960	0.1%
sodium	14100	14700	0.7%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 required.

Deionized Water Blank:

Chlorides were detected at 0.23 mg/L in deionized water blank GDEDW14D04, which was analyzed in SDG 28301B. Since the detections of chlorides in the two associated samples were greater than 5X the blank amount, no action was necessary.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in the equipment rinsate and field blanks, which were analyzed in SDG 28301B. No 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 1.6% for field duplicate samples 084HW00204 and 084GW00204 (analyzed in SDG 28301B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0% for field duplicate samples 573HW00104 and 573GW00104 (analyzed in SDG 28301B), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 28301B. 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0.7% for field duplicate samples 084HW00204 and 084GW00204 (analyzed in SDG 28301B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0.5% for field duplicate samples 573HW00104 and 573GW00104 (analyzed in SDG 28301B), which was within the 30% QC limit for water samples. No action was taken.

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 Blank:

TDS was not detected in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 44 mg/L in deionized water blank GDEDW14D04 and 48 mg/L in field blank GDEFW14D04, which were analyzed in SDG 28301B. The detection of TDS in associated sample 084HW00204, which was less than 5X the blank amounts, was flagged as undetected (U) with the detection limit being raised to the amount of contamination in the sample. TDS was not detected in equipment rinsate blank GDEEW14D04. No further 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 12.9% for field duplicate samples 573HW00104 and 573GW00104 (analyzed in SDG 28301B), which was within the 30% QC limit for water samples. Relative Percent Difference (RPD) for TDS was not calculable for field duplicate samples 084HW00204 and 084GW00204 (analyzed in SDG 28301B). No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28301B CLP Organics and Inorganics

SAMPLES: 083GW00204, 084GW00104, 084GW00204, 172GW00104, 172GW00104DL, 172GW00204, 172GW02D04, 573GW00104, 573GW01D04, GDEGW01404, GDEGW01504, GDEGW01804, GDEGW01804RE, GDEGW14D04, GDEGW15D04, GDEGW18D04, GDEDW14D04, GDEEW14D04, GDEFW14D04, GDEFW14D04RE, GDETW01404, GDETW01804, GDETW14D04

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) for bromoform and vinyl acetate were 37.5% and 26.0%, respectively, for the standard analyzed on 1/29/97 at 09:56 on instrument N. The non-detect results for these two compounds in associated samples 172GW00104, 172GW02D04 and GDEGW14D04 were flagged as estimated (UJ).

The Percent Difference (%D) for vinyl acetate was 29.4% for the standard analyzed on 1/30/97 at 09:33 on instrument N. The non-detect results for vinyl acetate in associated samples 172GW00204, GDEGW01404, GDEGW01504 and GDEGW15D04 were flagged as estimated (UJ).

The Percent Difference (%D) for vinyl acetate was 36.8% for the standard analyzed on 1/31/97 at 10:08 on instrument N. The non-detect results for vinyl acetate in associated samples GDEGW01804 and GDEGW18D04 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:

Acetone, chloroform and carbon disulfide were detected at 11 ug/L, 2 ug/L and 1 ug/L, respectively, in deionized water blank GDEDW14D04. Chloroform and carbon disulfide were not detected in the SDG samples. Acetone was qualified based on the equipment rinsate blank. No further action was necessary.

Equipment Rinsate Blank:

Acetone was detected at 18 ug/L in equipment rinsate blank GDEEW14D04. The detections of acetone in associated samples 172GW00204 and GDEGW01404, which were less than 10X the blank amount, were flagged as undetected (U) with analytical results below the CRQL being raised to the CRQL or the detection limit being raised to the amount of contamination in the sample.

Field Blank:

Chloroform was detected at 1 ug/L in field blank GDEFW14D04. Chloroform was not detected in the SDG samples. No action was required.

Trip Blanks:

There were no positive detections in the three trip blanks analyzed in this SDG. No action was taken.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. All LCS criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

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):

The concentration of chlorobenzene in sample 172GW00104 exceeded the linear standard calibration range. The result for chlorobenzene from dilution sample 172GW00104DL was transferred to the original analysis on the spreadsheets with dilution flag (D). No further action was taken.

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 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 Calibration:

The Percent Difference (%D) for benzo(b)fluoranthene was 36.5% for the standard analyzed on 2/3/97 at 10:33 on instrument S, which exceeded the 25% QC limit. All results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The

associated samples were 172GW00204, GDEGW01404, GDEGW01504 and GDEGW15D04.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections of target compounds in the three field blanks. No action was necessary.

TIC's:

2-Ethyl-1-hexanol was detected in each of the three field blanks. This TIC was not detected in the SDG samples. TIC's were not detected in the method blanks. No action was required.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 19% for 2-fluorophenol in sample 172GW02D04, which was below the 21-100% QC limits. Since only one surrogate was outside QC limits in the acid compound fraction, no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. One Percent Recovery was below the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met, so no action was required.

II.) Instrument Performance:

The Percent Difference (%D) for endrin was 28.2% on the secondary column for the PEM14K standard analyzed on 1/30/97 at 22:29, which exceeded the 25% QC limit. The non-detect result for endrin in associated sample GDEGW14D04 was flagged as estimated (UJ).

The Percent Differences (%D's) for endrin were 38.2% and 49.0%, respectively, on the primary and secondary columns for the PEM14L standard analyzed on 1/31/97 at 19:01, which exceeded the 25% QC limit. The non-detect results for endrin in associated samples GDEGW01404, GDEGW01504 and GDEGW15D04 were flagged as estimated (UJ).

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) for alpha-BHC and 4,4'-DDE were 22.8% and 23.2%, respectively, for the standards analyzed on the primary column on 1/28/97, which exceeded the 20% QC limit. Since only two compounds exceeded the QC limit with %RSD's less than 30%, no action was required.

Continuing Calibration:

The Percent Differences (%D's) for dieldrin and endrin were 26.2% and 27.0%, respectively, for the standards analyzed on the secondary column on 1/31/97 at 19:32, which exceeded the 25% QC limit. The non-detect results for dieldrin in associated samples GDEGW01404, GDEGW01504 and GDEGW15D04 were flagged as estimated (UJ). The non-detect results for endrin in the three samples were previously qualified based on the PEM14L standard. No further action was taken.

The Percent Differences (%D's) for dieldrin (29.4%), endrin (28.4%) and 4,4'-DDD (26.4%) exceeded

the 25% QC limit for the standards analyzed on the secondary column on 2/1/97 at 00:11. The non-detect results for 4,4'-DDD in associated samples GDEGW01404, GDEGW01504 and GDEGW15D04 were flagged as estimated (UJ). The non-detect results for dieldrin and endrin in the three samples were previously qualified based on the PEM14L and continuing calibration standards. No further 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. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Eight LCS's were analyzed by the laboratory. All LCS 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 necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) Overall Assessment of Data/General:

The reanalysis of sample GDEGW01804 was considered by the validator to be of preferable data quality compared to the original analysis because of improved surrogate recoveries. All laboratory data were acceptable with qualifications.

ORGANOTIN

I.) Holding Times:

All Holding Time criteria were met. 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 the standards analyzed on 2/5/97 were below the 0.050 QC limit for the following compounds:

monobutyltin	0.033
dibutyltin	0.029
tributyltin	0.020
tetrabutyltin	0.022

All results in associated sample 172GW00204 and field blanks GDEDW14D04, GDEEW14D04 and both analyses of GDEFW14D04, which consisted entirely of non-detects, were rejected (R).

Continuing Calibration:

A continuing calibration standard was not analyzed in this fraction of the SDG. No action was required.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

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 required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All LCS criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recoveries (%R's) of ISTD phenanthrene-d10 were 213% and 262%, respectively, for field blanks GDEFW14D04 and GDEFW14D04RE, which exceeded the 50-200% QC limits. All results for these two blank analyses were previously rejected because of low RRF's in the initial calibration. 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. No action was necessary.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

All laboratory data were rejected in all SDG samples and blanks because of low RRF's in the initial calibration.

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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB2	antimony	2.80 ug/L	14.0 ug/L
FB	beryllium	0.34 ug/L	1.70 ug/L
DWB	calcium	25.0 ug/L	125 ug/L
DWB	copper	2.00 ug/L	10.0 ug/L
DWB	thallium	4.30 ug/L	21.5 ug/L
FB	tin	30.6 ug/L	153 ug/L
DWB	zinc	8.60 ug/L	43.0 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized WaterBlank (GDEDW14D04), FB = Field Blank (GDEFW14D04)

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, deionized water or field 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
barium	2 ug/L
cadmium	1 ug/L
chromium	3 ug/L
lead	2 ug/L
selenium	5 ug/L
thallium	6 ug/L
tin	7 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.

A negative result for zinc (-9 ug/L) was observed in ICS Solution A at an absolute concentration above the IDL. Since neither aluminum, calcium, iron nor magnesium was present in the associated

sample at a concentration comparable to or above the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed in this fraction of the 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 required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples, 084GW00204 and 084HW00204 (analyzed in SDG 28301A) and 573GW00104 and 573HW00104 (analyzed in SDG 28301A), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	084HW00204, ug/L	084GW00204, ug/L	RPD
arsenic	37.2	38.4	3.2%
calcium	14300	14900	4.1%
iron	1760	1840	4.4%
manganese	164	171	4.2%
sodium	30100	30400	1.0%

Analyte	573HW00104, ug/L	573GW00104, ug/L	RPD
calcium	75500	74300	1.6%
iron	3690	3650	1.1%
magnesium	14800	14700	0.7%
manganese	211	208	1.4%
potassium	9970	9960	0.1%
sodium	14100	14700	0.7%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 required.

Deionized Water Blank:

Chlorides were detected at 0.23 mg/L in deionized water blank GDEDW14D04. Since the detections of chlorides in all SDG samples were greater than 5X the blank amount, no action was necessary.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in the equipment rinsate and field blanks. No 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 1.6% for field duplicate samples 084GW00204 and 084HW00204 (analyzed in SDG 28301A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0% for field duplicate samples 573GW00104 and 573HW00104 (analyzed in SDG 28301A), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0.7% for field duplicate samples 084GW00204 and 084HW00204 (analyzed in SDG 28301A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for sulfates was 0.5% for field duplicate samples 573GW00104 and 573HW00104 (analyzed in SDG 28301A), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 44 mg/L in deionized water blank GDEDW14D04 and 48 mg/L in field blank GDEFW14D04. The detections of TDS in associated samples 084GW00204, GDEGW01504 and GDEGW01804, which were less than 5X the blank amounts, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample. TDS was not detected in equipment rinsate blank GDEEW14D04. No further 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 28.6% for field duplicate samples 084HW00204 and 084GW00204 (analyzed in SDG 28301B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for TDS was 12.9% for field duplicate samples 573GW00104

and 573HW00104 (analyzed in SDG 28301A), which was within the 30% QC limit for water samples. No action was taken.

VIII.) 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:	0206
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHOD:	EPA SOW 3-90 / SW-846
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, Organotin, Total Metals, Cyanide, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28346A (Level IV, Appendix IX) 28346B (Level III)

SAMPLES:

SDG 28346A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEHW19D04*	28391-04	Water	X	X	X	X
570DW00204	28391-01	Water	X	X	X	X
570EW00204	28391-02	Water	X	X	X	X
570FW00204	28391-03	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEHW19D04*	28391-04	Water	X	X	X	X
570DW00204	28391-01	Water	X	X	X	X
570EW00204	28391-02	Water	X	X	X	X
570FW00204	28391-03	Water	X	X	X	X

* = Corresponding sample GDEGW19D04 was analyzed in SDG 28346B.

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, F = FIELD BLANK, HW = FIELD DUPLICATE

SDG 28346B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
570GW00104	28367-03	Water	X			X
570GW00204	28390-01	Water	X			X
570GW02D04	28367-04	Water	X			X
572GW00104	28346-01	Water	X			X
572GW00204	28367-01	Water	X			X
572GW00304	28367-02	Water	X			X
GDEGW01604	28367-09	Water	X	X	X	X
GDEGW01704	28367-05	Water	X	X	X	X
GDEGW01904	28390-02	Water	X	+	X	X
GDEGW01904RE	28390-02RE	Water		X		
GDEGW16D04	28346-02	Water	X	X	X	X
GDEGW17D04	28367-08	Water	X	X	X	X
GDEGW17D04DL	28367-08DL	Water	+			
GDEGW19D04*	28390-03	Water	X	X	X	X
GDETW01604	28367-11	Water	X			
GDETW16D04	28346-03	Water	X			
GDETW19D04	28390-04	Water	X			
570GW00204MS	28390-01MS	Water	+			
570GW00204MSD	28390-01MSD	Water	+			
GDEGW01704MS	28367-06MS	Water	+	+	+	+
GDEGW01704MSD	28367-07MSD	Water	+	+	+	+

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
570GW00104	28367-03	Water		X	X	X
570GW00204	28390-01	Water		X	X	X
570GW02D04	28367-04	Water		X	X	X
572GW00104	28346-01	Water		X	X	X
572GW00204	28367-01	Water		X	X	X
572GW00304	28367-02	Water		X	X	X
GDEGW01604	28367-09	Water	X	X	X	X
GDEGW01704	28367-05	Water	X	X	X	X
GDEGW01904*	28390-02	Water	X	X	X	X
GDEGW16D04	28346-02	Water	X	X	X	X
GDEGW17D04	28367-08	Water	X	X	X	X
GDEGW19D04	28390-03	Water	X	X	X	X
GDEGW01704MS	28367-06MS	Water	+	+	+	
GDEGW01704MSD	28367-07MSD	Water	+	+	+	

+ = Non-billable analysis
* = Corresponding duplicate sample GDEHW19D04 was analyzed in SDG 28346A.

DL = DILUTION, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE,
RE = REANALYSIS, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28346A Appendix IX, CLP Inorganics

SAMPLES: GDEHW19D04, 570DW00204, 570EW00204, 570FW00204

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 the standards analyzed on 1/13/97 on instrument N were below the 0.050 QC limit for the following compounds:

trans-1,4-dichloro-2-butene	0.046
acetonitrile	0.036
isobutyl alcohol	0.007
1,4-dioxane	0.002

All results for these compounds in the associated sample and three field blanks, which consisted entirely of non-detects, were rejected (R). The associated sample and field blanks were GDEHW19D04, 570DW00204, 570EW00204 and 570FW00204.

The Percent Relative Standard Deviations (%RSD's) for 1,4-dioxane and dichlorodifluoromethane were 60.9% and 71.8%, respectively, for the standards analyzed on 1/13/97 on instrument N, which exceeded the 30% QC limit. The non-detect sample result for 1,4-dioxane were previously rejected because of a low RRF in this calibration. Dichlorodifluoromethane was not detected in the associated sample and field blanks. No further action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) for the standards analyzed on 2/6/97 at 11:30 on instrument N were below the 0.050 QC limit for the following compounds:

acrolein	0.046
acetonitrile	0.032
isobutyl alcohol	0.009
1,4-dioxane	0.002

The non-detect results for acetonitrile, isobutyl alcohol and 1,4-dioxane were previously rejected because of low RRF's in the initial calibration. The non-detect results for acrolein in the associated sample and field blanks were rejected. The associated sample and field blanks were GDEHW19D04, 570DW00204, 570EW00204 and 570FW00204.

The Percent Difference (%D's) for the standards analyzed on 2/6/97 at 11:30 on instrument N exceeded the 25% QC limit for the following compounds:

vinyl acetate	43.7%
bromoform	39.1%
acrolein	62.6%
trans-1,4-dichloro-2-butene	87.0%
isobutyl alcohol	28.6%
dichlorodifluoromethane	38.3%

The non-detect results for acrolein, trans-1,4-dichloro-2-butene and isobutyl alcohol were previously rejected because of low RRF's in this and the initial calibrations. The non-detect results for vinyl acetate, bromoform and dichlorodifluoromethane in associated sample GDEHW19D04 were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

Chloroform was detected at 1 ug/L, 2 ug/L and 2 ug/L, respectively, in the deionized water, equipment rinsate and field blanks. Chloroform was not detected in the associated SDG sample. No action was necessary.

Trip Blank:

There were no detections in trip blank GDETW19D04 analyzed in SDG 28346B. No action was taken.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was required.

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. 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 acrolein, trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample GDEHW19D04 and the three field blanks 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. 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) for the standards analyzed on 1/16/97 on instrument N exceeded the 30% QC limit for the following compounds:

2-picoline	30.5%
m-cresol	31.9%
n-nitrosopiperdine	35.2%
o,o,o-tieethyl phosphorothioate	31.2%
2,6-dichlorophenol	35.0%
hexachloropropene	35.2%
n-nitrosodi-n-butylamine	32.2%
1,2,4,5-tetrachlorobenzene	34.8%
safrole	35.0%
isosafrole	35.9%
1,4-naphthoquinone	35.6%
1,3-dinitrobenzene	40.3%
pentachlorobenzene	32.4%
1-naphthylamine	37.1%
2-naphthylamine	33.3%
4-nitroquinoline-1-oxide	35.0%
thionazin	36.8%
diphenylamine	33.8%
sulfotep	37.1%
1,3,5-trinitrobenzene	31.2%
phorate	36.0%
phenacetin	38.7%
diallate	36.6%
dimethoate	35.9%
4-aminobiphenyl	34.1%
pronamide	40.4%
pentachloronitrobenzene	33.4%
disulfoton	32.5%
methyl parathion	38.6%
parathion	43.1%
isodrin	34.9%
kepone	44.9%
famphur	57.6%
acetamidofluorene	33.1%
7,12-dimethylbenz(a)anthracene	47.2%

These compounds were not detected in associated sample GDEHW19D04. No action was taken.

Continuing Calibration:

The Relative Response Factor (RRF) for hexachlorophene was 0.029 for the standards analyzed on 2/12/97 at 11:47 on instrument N, which was below the 0.050 QC limit. The non-detect results for this compound in associated sample GDEHW19D04 and field blanks 570DW00204, 570EW00204 and 570FW00204 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 2/21/97 at 11:47 on instrument N for the following compounds:

pyridine	34.8%
methyl methanesulfonate	53.5%
n-nitrosomethylethylamine	26.1%
o-toluidine	27.9%
n-nitrosopiperdine	31.8%
o,o,o-tieethyl phosphorothioate	34.8%
safrole	56.9%
isosafrole	45.0%
1-naphthylamine	38.5%
2-naphthylamine	33.5%
4-aminobiphenyl	45.4%
pentachloronitrobenzene	39.3%
disulfoton	59.5%
3,3'-dimethylbenzidine	36.0%
famphur	80.1%
diphenylamine	52.7%
sulfotep	48.4%
1,3,5-trinitrobenzene	47.7%
4-methylphenol	41.3%
p-phenylenediamine	26.7%
hexachlorophene	44.7%

The non-detect result for hexachlorophene was previously rejected in associated sample GDEHW19D04 because of a low RRF in this calibration. All results for the other compound in this sample, 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, Equipment Rinsate and Field Blanks:

There were no detections in the equipment rinsate and field blank. Bis(2-ethylhexyl)phthalate was detected at 3 ug/L in deionized water blank 570DW00204. This compound was not detected in associated sample GDEHW19D04. No action was necessary.

TIC's:

TIC's were not detected in the method or field blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. Several Percent Recoveries were outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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:

Hexachlorophene was rejected in sample GDEHW19D04 and the three field blanks because of a low RRF in the continuing calibration. 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 Instrument Performance criteria were met. 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 required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the field duplicate samples analyzed in this SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) 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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB4	antimony	3.70 ug/L	14.0 ug/L
DWB	barium	0.51 ug/L	2.55 ug/L
ERB	calcium	26.6 ug/L	133 ug/L
FB	copper	1.90 ug/L	9.50 ug/L
DWB	thallium	5.70 ug/L	28.5 ug/L
ERB	zinc	5.70 ug/L	28.5 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank (570DW00204), ERB = Equipment Rinsate Blank (570EW00204), FB = Field Blank (570FW00204)

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, deionized water, equipment rinsate or field blank were flagged as undetected (U).

A negative result for cyanide (-2.10 ug/L) was observed in the initial calibration blank. The non-detect result for cyanide in sample GDEHW19D04 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	4 ug/L
arsenic	3 ug/L
cobalt	1 ug/L
copper	1 ug/L
lead	4 ug/L
manganese	1 ug/L
nickel	1 ug/L
selenium	3 ug/L
silver	1 ug/L
thallium	11 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.

V.) ICP Serial Dilution Analysis:

Serial Dilution Analysis was not performed in this fraction of the 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 fraction of the SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples, GDEHW19D04 / GDEGW19D04 (analyzed in SDG 28346B), was evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEHW19D04, ug/L	GDEGW19D04, ug/L	RPD
calcium	106000	107000	0.9%
iron	148	160	7.8%
magnesium	6940	7080	2.0%
manganese	39.9	40.6	1.7%

Analyte	GDEHW19D04, ug/L	GDEGW19D04, ug/L	RPD
sodium	80700	84400	4.5%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 required.

Deionized Water Blank:

Chlorides were detected at 0.24 mg/L in deionized water blank 570DW00204. Since the detection of chlorides in associated sample GDEHW19D04 was greater than 5X the blank amount, no action was necessary.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in the equipment rinsate and field blanks. No 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 0.5% for field duplicate samples GDEHW19D04 and GDEGW19D0404 (analyzed in SDG 28346B), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 2.2% for field duplicate samples GDEHW19D04 and GDEGW19D04 (analyzed in SDG 28346B), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 3.5% for field duplicate samples GDEHW19D04 and GDEGW19D04 (analyzed in SDG 28346B), which was within the 30% QC limit for water samples. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28346B CLP Organics and Inorganics

SAMPLES: 570GW00104, 570GW00204, 570GW02D04, 572GW00104, 572GW00204, 572GW00304, GDEGW01604, GDEGW01704, GDEGW01904, GDEGW01904RE, GDEGW16D04, GDEGW17D04, GDEGW17D04DL, GDEGW19D94, GDETW01604, GDETW16D04, GDETW19D04, 570GW00204MS, 570GW00204MSD, GDEGW01704MS, GDEGW01704MSD

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) for bromoform and vinyl acetate were 39.1% and 43.7%, respectively, for the standard analyzed on 2/6/97 at 11:30 on instrument N, which exceeded the 25% QC limit. The non-detect results for these two compounds in associated samples 570GW00204, GDEGW01904 and GDEGW19D04 were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

Chloroform was detected at 1 ug/L, 2 ug/L and 2 ug/L, respectively, in the deionized water, equipment rinsate and field blanks, which were analyzed in SDG 28346A. Chloroform was not detected in the associated SDG samples. No action was necessary.

Trip Blanks:

There were no positive detections in the three trip blanks analyzed in this SDG. No action was taken.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. All LCS criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the field duplicate samples analyzed in this SDG. No action was required.

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):

The concentration of tetrachloroethene in sample GDEGW17D04 exceeded the linear standard calibration range. The result for tetrachloroethene from dilution sample GDEGW17D04DL was transferred to the original analysis on the spreadsheets. All other CRQL criteria were met. No further action was taken.

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 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 Calibration:

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 2/12/97 at 12:14 on instrument M for the following compounds:

benzoic acid	35.0%
2,4-dinitrophenol	31.1%
2-methyl-4,6-dinitrophenol	27.3%

The non-detect results for these three compounds in associated samples GDEGW01904RE and GDEGW19D04 were flagged as estimated (UJ).

V.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no detections in the equipment rinsate and field blanks, which were analyzed in SDG 28346A. Bis(2-ethylhexyl)phthalate was detected at 3 ug/L in deionized water blank 570DW00204 (analyzed in SDG 28346A). This compound was not detected in associated samples. No action was necessary.

TIC's:

TIC's were not detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Percent Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. Three Percent Recoveries were below the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the field duplicate samples analyzed in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

The Percent Recovery (%R) of perylene-d12 in sample GDEGW01904RE was 48%, which was below the 50-200% QC limits. All results in this sample for compounds quantified on this ISTD, which consisted entirely of non-detects, were flagged as estimated (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. 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 GDEGW01904 was considered by the validator to be of preferable data quality as compared to the original analysis because of improved internal standard recoveries. 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:

All Initial and 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.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 28346A. 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 in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Difference (RPD's) exceeded the QC limits for spiked samples GDEGW01704MS and GDEGW01704MSD for the following compounds:

Compound	RPD	QC Limit
alpha-BHC	34%	20%
beta-BHC	26%	20%
gamma-BHC	30%	15%
delta-BHC	30%	20%
heptachlor	34%	20%
aldrin	29%	22%

Compound	RPD	QC Limit
heptachlor epoxide	28%	20%
endosulfan I	27%	20%
4,4'-DDE	32%	20%
dieldrin	32%	18%
endrin	30%	21%
endosulfan II	25%	20%
4,4'-DDD	26%	20%
endosulfan sulfate	26%	20%
4,4'-DDT	30%	27%
endrin aldehyde	38%	20%
methoxychlor	24%	20%
alpha-chlordane	26%	20%
gamma-chlordane	28%	20%
endrin ketone	38%	20%

All results for these compounds in unspiked sample GDEGW01704, which consisted entirely of non-detects, were flagged as estimated (UJ).

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the field duplicate samples in this SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB4	antimony	3.70 ug/L	14.0 ug/L
DWB	barium	0.51 ug/L	2.55 ug/L
ERB	calcium	26.6 ug/L	133 ug/L
FB	copper	1.90 ug/L	9.50 ug/L
DWB	thallium	5.70 ug/L	28.5 ug/L
ERB	zinc	5.70 ug/L	28.5 ug/L

CCB = Continuing Calibration Blank, DWB = Deionized Water Blank (570DW00204), ERB = Equipment Rinsate Blank (570EW00204), FB = Field Blank (570FW00204)

The field blanks (DWB, ERB and FB) were analyzed in SDG 28346A. 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, deionized water, equipment rinsate or field blank were flagged as undetected (U).

A negative result for cyanide (-2.10 ug/L) was observed in the initial calibration blank. The non-detect results for cyanide in the SDG samples 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:

antimony	4 ug/L
arsenic	3 ug/L
cobalt	1 ug/L
copper	1 ug/L
lead	4 ug/L
manganese	1 ug/L
nickel	1 ug/L

selenium	3 ug/L
silver	1 ug/L
thallium	11 ug/L
vanadium	1 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.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was required.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples, GDEGW19D04 / GDEHW19D04 (analyzed in SDG 28346A), was evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEHW19D04, ug/L	GDEGW19D04, ug/L	RPD
calcium	106000	107000	0.9%
iron	148	160	7.8%
magnesium	6940	7080	2.0%
manganese	39.9	40.6	1.7%
sodium	80700	84400	4.5%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 required.

Deionized Water Blank:

Chlorides were detected at 0.24 mg/L in deionized water blank 570DW00204, which was analyzed in SDG 28346A. Since the detections of chlorides in the associated samples were greater than 5X the blank amount, no action was necessary.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in the equipment rinsate and field blanks, which were analyzed in SDG 28346A. No 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):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 0.5% for field duplicate samples GDEGW19D04 and GDEHW19D04 (analyzed in SDG 28346A), which was within the 30% QC limit

for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 28346A. 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 criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 2.2% for field duplicate samples GDEGW19D04 and GDEHW19D04 (analyzed in SDG 28346A), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field blanks, which were analyzed in SDG 28346A. 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 3.5% for field duplicate samples GDEGW19D04 and GDEHW19D04 (analyzed in SDG 28346A), which was within the 30% QC limit for water samples. 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 Navel Base, Zone E
SERVICE ORDER NUMBER:	0209
CONTRACTED LAB:	Southwest Laboratory of Oklahoma, Inc
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHODS:	EPA SOW 3-90 / SW846
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, Chloride, Sulfate, Total Dissolved Solids (TDS)
SDG NUMBERS:	28394A (Appendix IX, Level IV) 28394B (Level III)

SAMPLES:

SDG 28394A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Total Metals
569HW01D04*	28405.01	Water	X	X
569HW00204*	28419.01	Water	X	X

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
569HW01D04*	28405.01	Water	X	X	X
569HW00204*	28419.01	Water	X	X	X

* = Corresponding samples 569GW01D04 and 569GW00204 were analyzed in SDG 28394B.

HW = FIELD DUPLICATE

SDG 28394B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
559GW00104	28418.03	Water	X	X		X
559GW00204	28418.04	Water	X	X		X
563GW00104	28394.03	Water	X			X
563GW00204	28404.01	Water	X			X
563GW00304	28404.02	Water	X			X
563GW01D04	28394.04	Water	X			X
569GW00104	28404.03	Water	X			X
569GW00204*	28418.05	Water	X			X
569GW01D04*	28404.04	Water	X			X
570GW00304	28394.01	Water	X			X
570GW03D04	28394.02	Water	X			X
GDEGW02004	28394.06	Water	X	X	X	X
GDEGW02104	28404.05	Water	X	X	X	X
GDEGW02204	28418.01	Water	X	X	X	X
GDEGW20D04	28394.05	Water	X	X	X	X
GDEGW21D04	28404.06	Water	X	X	X	X
GDEGW22D04	28418.02	Water	X	X	X	X
569TW00204	28418.06	Water	X			
569TW01D04	28404.07	Water	X			
GDETW02004	28394.07	Water	X			
563GW00204MS	28404.01MS	Water	+			
563GW00204MSD	28404.01MSD	Water	+			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
559GW00104	28418.03	Water		X	X	X
559GW00204	28418.04	Water		X	X	X
563GW00104	28394.03	Water		X	X	X
563GW00204	28404.01	Water		X	X	X
563GW00304	28404.02	Water		X	X	X
563GW01D04	28394.04	Water		X	X	X
569GW00104	28404.03	Water		X	X	X
569GW00204*	28418.05	Water		X	X	X
569GW01D04*	28404.04	Water		X	X	X
570GW00304	28394.01	Water		X	X	X
570GW03D04	28394.02	Water		X	X	X
GDEGW02004	28394.06	Water	X	X	X	X
GDEGW02104	28404.05	Water	X	X	X	X
GDEGW02204	28418.01	Water	X	X	X	X
GDEGW20D04	28394.05	Water	X	X	X	X
GDEGW21D04	28404.06	Water	X	X	X	X
GDEGW22D04	28404.07	Water	X	X	X	X

* = Corresponding field duplicate samples 569HW00204 and 569HW01D04 were analyzed in SDG 28394A.

TW = TRIP BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 28394A Appendix IX, CLP Organics and Inorganics

SAMPLES: 569HW01D04, 569HW00204

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 trans-1,4-dichloro-2-butene (0.046), acetonitrile (0.036), isobutyl alcohol (0.007) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the initial calibration analyzed on 1/13/97 on instrument N. The non-detect results for these compounds in the two associated samples were rejected (R).

Continuing Calibration:

The Relative Response Factors (RRF's) for acrolein (0.038), acetonitrile (0.031), isobutyl alcohol (0.008) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the continuing calibration standard analyzed on 2/7/97 at 11:56 on instrument N. The non-detect result for acrolein in associated sample 569HW01D04 was rejected (R). The non-detect results for other compounds in the associated sample were previously rejected due to very low RRFs in the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 2/7/97 at 11:56 on instrument N for the following compounds:

vinyl acetate	46.3%
bromoform	33.9%
2-chloroethyl vinyl ether	34.9%
acrolein	69.1%
trans-1,4-dichloro-2-butene	65.2%

The non-detect results for acrolein and trans-1,4-dichloro-2-butene in associated sample 569HW01D04 were previously rejected due to very low RRFs in the initial and continuing calibrations. All results for

other compounds in the associated sample, which consisted entirely of non-detects, were flagged as estimated (UJ). No further action was required.

The Relative Response Factors (RRFs) for acrolein (0.042), acetonitrile (0.036), isobutyl alcohol (0.009) and 1,4-dioxane (0.002) were below the 0.050 QC limit for the continuing calibration standard analyzed on 2/10/97 at 10:55 on instrument N. The non-detect result for acrolein in associated sample 569HW00204 was rejected (R). The non-detect results for other compounds in the associated sample were previously rejected due to very low RRFs in the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 2/7/97 at 11:56 on instrument N for the following compounds:

bromoform	43.2%
acrolein	65.9%
trans-1,4-dichloro-2-butene	84.8%
isobutyl alcohol	28.6%
dichlorodifluoromethane	50.4%

The non-detect results for acrolein, trans-1,4-dichloro-2-butene and isobutyl alcohol in associated sample 569HW00204 were previously rejected due to very low RRFs in the initial and continuing calibrations. The non-detect results for other compounds in the associated sample were flagged as estimated (UJ). No further action was required.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Trip Blanks:

There were no positive detections in the trip blanks (analyzed in 28394B). No action was taken.

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.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed in this SDG. Samples 569HW01D04 and

569HW00204 were analyzed in this SDG, while corresponding duplicate samples 569GW01D04 and 569GW00204 were analyzed in SDG 28394B. There were no calculable Relative Percent Differences (RPD's) for the two sets of field duplicate samples. No action was required.

VIII.) Internal Standards Performance (ISTD):

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 taken.

X.) Compound Quantitation and Reported Contract Required Quantitation Limits (CRQL's):

All CRQL criteria were met, so no action was necessary.

XI.) Tentatively Identified Compounds (TIC's):

All TIC Identification criteria were met, so no action was required.

XII.) System Performance:

All System Performance criteria were met. No action was taken.

XIII.) Overall Assessment of Data/General:

The non-detect results for acrolein, acetonitrile, trans-1,4-dichloro-2-butene, isobutyl alcohol and 1,4-dioxane were rejected in the two samples in this SDG due to low RRF's in the initial and continuing calibrations. The 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 required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	barium	0.41 ug/L	2.05 ug/L
CCB2	thallium	4.10 ug/L	20.5 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount 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.
ICB	copper	-1.10 ug/L	5.50 ug/L
CCB3	silver	-1.90 ug/L	9.50 ug/L
CCB4	thallium	-4.40 ug/L	22.0 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank

All associated 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.

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:

Duplicate Sample Analysis was not performed in this fraction of the SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples were analyzed in this SDG. Samples 569HW01D04 and 569HW00204 were analyzed in this SDG, while corresponding samples 569GW01D04 and

569GW00204 were analyzed in SDG 28394B. The calculable Relative Percent Differences (RPD's) were:

Analyte	569GW01D04, ug/L	569HW01D04, ug/L	RPD
calcium	59600	57900	3%
iron	633	615	3%
magnesium	7410	7240	2%
manganese	114	110	4%
sodium	38000	37500	1%

Analyte	569GW00204, ug/L	569HW00204, ug/L	RPD
calcium	16900	15900	6%
iron	280	250	11%
manganese	71.3	66.9	6%
sodium	10300	9580	7%

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.

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:

Chlorides were not detected in the method blanks. No action was necessary.

IX.) 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 of the SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 569HW01D04 and 569HW00204 were analyzed in this SDG, while corresponding samples 569GW01D04 and 569GW00204 were analyzed in SDG 28394B. The calculable Relative Percent Differences (RPD's) for chlorides were:

569HW01D04	569GW01D04	RPD
37.9 mg/L	37.3 mg/L	1%

569HW00204	569GW00204	RPD
7.3 mg/L	7.3 mg/L	0%

Both RPD's for chlorides 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 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 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 of the SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 569HW01D04 and 569HW00204 were analyzed in this SDG, while corresponding samples 569GW01D04 and 569GW00204 were analyzed in SDG 28394B. The calculable Relative Percent Differences (RPD's) for sulfates were:

569HW01D04	569GW01D04	RPD
69.6 mg/L	69.2 mg/L	1%

569HW00204	569GW00204	RPD
43.2 mg/L	42.9 mg/L	1%

Both RPD's for sulfates 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. No action was taken.

III.) Blanks:

TDS 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not required for TDS. No action was taken.

VII.) Field Duplicates:

Two sets of field duplicate samples were analyzed. Samples 569HW01D04 and 569HW00204 were analyzed in this SDG, while corresponding samples 569GW01D04 and 569GW00204 were analyzed in SDG 28394B. The calculable Relative Percent Differences (RPD's) for TDS were:

569HW01D04	569GW01D04	RPD
316 mg/L	312 mg/L	1%

569HW00204	569GW00204	RPD
76 mg/L	104 mg/L	31%

The RPD for TDS was within the 30% QC limit for field duplicate samples 569GW01D04 and 569HW01D04. No action was necessary. The RPD exceeded the 30% QC limit in field duplicate samples 569GW00204 and 569HW00204. The positive results for TDS were flagged as estimated (J) in the two samples.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratory of Oklahoma, Inc - 28394B, CLP Organics and Inorganics

SAMPLES: 559GW00104, 559GW00204, 563GW00104, 563GW00204, 563GW00304, 563GW01D04, 569GW00104, 569GW00204, 569GW01D04, 570GW00304, 570GW03D04, GDEGW02004, GDEGW02104, GDEGW02204, GDEGW20D04, GDEGW21D04, GDEGW22D04, 569TW00204, 569TW01D04, GDETW02004, 563GW00204MS, 563GW00204MSD

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:

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 2/6/97 at 11:30 on instrument N for the following compounds:

vinyl acetate	43.7%
bromoform	39.1%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 570GW00304, 570GW03D04, 563GW00104, 563GW01D04, GDEGW20D04 and GDEGW02004.

The Percent Differences (%D's) exceeded the 25% QC limit for the standard analyzed on 2/7/97 at 11:56 on instrument N for the following compounds:

vinyl acetate	46.3%
bromoform	33.9%
2-chloroethyl vinyl ether	34.9%

All results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 563GW00204, 563GW00304, 569GW00104, 569GW01D04, GDEGW02104 and GDEGW21D04.

The Percent Difference (%D) for carbon disulfide was 30.3% which exceeded the 25% QC limit for the standard analyzed on 2/11/97 at 10:24 on instrument N. All results for carbon disulfide in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDEGW02204, GDEGW22D04, 559GW00104, 559GW00204 and 569GW00204.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks, no action was taken.

Trip Blank:

Chloroform (110 ug/L) and bromodichloromethane (22 ug/L) were detected in trip blank GDETW02004. Since these two compounds were not detected in the associated samples, no action was taken.

TIC's:

All TIC criteria were met. No action was required.

V.) Surrogate Recoveries:

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

VI.) Laboratory Control Sample (LCS):

Six LCS's were analyzed in this SDG. One LCS Recovery was below the QC limits. Data validation action based on LCS Recovery criteria 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:

Samples 569GW01D04 and 569GW00204 were analyzed in this SDG, while corresponding duplicate samples 569HW01D04 and 569HW00204 were analyzed in SDG 28394A. There were no calculable Relative Percent Differences (RPD's) for the two sets of field duplicate samples. No action was required.

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, so no action was necessary.

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, so no action was required.

IV.) Blanks:

There were no positive detections in the method blanks. No action was taken.

TIC's:

All TIC criteria were met. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Laboratory Control Sample (LCS):

One LCS sample was analyzed with this SDG. Two LCS Recoveries were below the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

There were no MS / MSD samples in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

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 necessary.

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 without qualification.

PESTICIDES/PCB's

I.) Holding Times:

All Holding Time criteria were met. No action was required.

II.) Instrument Performance:

All Pesticide Instrument Performance criteria were met. No action was taken.

III.) Calibration:

All Initial and 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 taken.

VI.) Laboratory Control Sample (LCS):

All LCS Percent Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) Field Duplicates:

There were no field duplicate samples in this fraction of the SDG. No action was taken.

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.

XI.) 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 required.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	barium	0.41 ug/L	2.05 ug/L
CCB2	thallium	4.10 ug/L	20.5 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

All results greater than the IDL but less than 5X the blank amount 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.
ICB	copper	-1.10 ug/L	5.50 ug/L
CCB3	silver	-1.90 ug/L	9.50 ug/L
CCB4	thallium	-4.40 ug/L	22.0 ug/L
ICB	cyanide	-2.10 ug/L	10.5 ug/L

CCB = Continuing Calibration Blank, ICB = Initial Calibration Blank,

All associated 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.

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 taken.

VII.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VIII.) Matrix Spike Recoveries:

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Samples 569GW01D04 and 569GW00204 were analyzed in this SDG, while corresponding duplicate samples 569HW01D04 and 569HW00204 were analyzed in SDG 28394A. The calculable Relative Percent Differences (RPD's) were:

Analyte	569GW01D04, ug/L	569HW01D04, ug/L	RPD
calcium	59600	57900	3%
iron	633	615	3%
magnesium	7410	7240	2%
manganese	114	110	4%
sodium	38000	37500	1%

Analyte	569GW00204, ug/L	569HW00204, ug/L	RPD
calcium	16900	15900	6%
iron	280	250	11%
manganese	71.3	66.9	6%
sodium	10300	9580	7%

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.

CHLORIDES

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) 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. No action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

Samples 569GW01D04 and 569GW00204 were analyzed in this SDG, while corresponding duplicate samples 569HW01D04 and 569HW00204 were analyzed in SDG 28394A. The calculable Relative Percent Differences (RPD's) for chlorides were:

569HW01D04	569GW01D04	RPD
37.9 mg/L	37.3 mg/L	1%

569HW00204	569GW00204	RPD
7.3 mg/L	7.3 mg/L	0%

Both RPD's for chlorides 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.

SULFATES

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) 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. No action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample analysis was not performed for this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Field Duplicates:

Samples 569GW01D04 and 569GW00204 were analyzed in this SDG, while corresponding duplicate samples 569HW01D04 and 569HW00204 were analyzed in SDG 28394A. The calculable Relative Percent Differences (RPD's) for sulfates were:

569HW01D04	569GW01D04	RPD
69.6 mg/L	69.2 mg/L	1%

569HW00204	569GW00204	RPD
43.2 mg/L	42.9 mg/L	1%

Both RPD's for sulfates 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. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

TDS was not detected in the method blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. No action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD analyses were not required for TDS. No action was taken.

VII.) Field Duplicates:

Samples 569GW01D04 and 569GW00204 were analyzed in this SDG, while corresponding duplicate samples 569HW01D04 and 569HW00204 were analyzed in SDG 28394A. The calculable Relative Percent Differences (RPD's) for TDS were:

569HW01D04	569GW01D04	RPD
316 mg/L	312 mg/L	1%

569HW00204	569GW00204	RPD
76 mg/L	104 mg/L	31%

The RPD's for TDS was within the 30% QC limit for field duplicate samples 569GW01D04 and 569HW01D04. No action was necessary. The RPD exceeded the 30% QC limit in field duplicate samples 569GW00204 and 569HW00204. The positive results for TDS were flagged as estimated (J) in the two samples.

VIII.) 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:	0211
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHODS:	EPA SOW 3-90 / SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28438A (Level IV, Appendix IX) 28438B (Level III)

SAMPLES:

SDG 28438A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
559HW03D04*	28439-01	Water	X	X		X
GDEHW00504*	28460-01	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
559HW03D04*	28439-01	Water		X	X	X
GDEHW00504*	28460-01	Water	X	X	X	X

* = Corresponding samples 559GW03D04 and GDEGW00504 were analyzed in SDG 28438B.

H = FIELD DUPLICATE

SDG 28438B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
559GW00304	28438-04	Water	X			X
559GW00404	28466-01	Water	X			X
559GW00504	28466-03	Water	X			X
559GW00504DL	28466-03DL	Water	+			
559GW02D04	28438-03	Water	X			X
559GW03D04*	28438-05	Water	X			X
559GW04D04	28466-02	Water	X			X
GDEGW00504*	28459-01	Water	X	X	X	X
GDEGW02304	28438-01	Water	X	X	X	X
GDEGW02404	28466-05	Water	X	X	X	X
GDEGW23D04	28438-02	Water	X	X	X	X
GDEGW24D04	28466-04	Water	X	X	X	X
GDEGW24D04RE	28466-04RE	Water		+		
GDEDW00504	28459-02	Water	X	X	X	X
GDEEW00504	28459-03	Water	X	X	X	X
GDEFW00504	28459-04	Water	X	X	X	X
559TW03D04	28438-06	Water	X			
GDETW00504	28459-05	Water	X			
GDETW02404	28466-06	Water	X			
559GW00404MS	28466-01MS	Water	+			
559GW00404MSD	28466-01MSD	Water	+			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
559GW00304	28438-04	Water		X	X	X
559GW00404	28466-01	Water		X	X	X
559GW00504	28466-03	Water		X	X	X
559GW02D04	28438-03	Water		X	X	X
559GW03D04*	28438-05	Water		X	X	X
559GW04D04	28466-02	Water		X	X	X
GDEGW00504*	28459-01	Water	X	X	X	X
GDEGW02304	28438-01	Water	X	X	X	X
GDEGW02404	28466-05	Water	X	X	X	X
GDEGW23D04	28438-02	Water	X	X	X	X
GDEGW24D04	28466-04	Water	X	X	X	X
GDEDW00504	28459-02	Water	X	X	X	X
GDEEW00504	28459-03	Water	X	X	X	X
GDEFW00504	28459-04	Water	X	X	X	X

* = Corresponding duplicate samples 559HW03D04 and GDEHW00504 were analyzed in SDG 28438A.
+ = Non-billable analysis

DL = DILUTION ANALYSIS, DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, RE = REANALYSIS, TW = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28438A Appendix IX, CLP Organics and Inorganics

SAMPLES: 559HW03D04, GDEHW00504

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 1/13/97 on instrument N for the following compounds:

trans-1,4-dichloro-2-butene	0.046
acetonitrile	0.036
isobutyl alcohol	0.007
1,4-dioxane	0.002

The non-detect results for these compounds in associated samples 559HW03D04 and GDEHW00504 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for dichlorodifluoromethane and 1,4-dioxane were 71.8% and 60.9%, respectively, for the standards analyzed on 1/13/97 on instrument N, which were above the 30% QC limit. The non-detect results for 1,4-dioxane were previously rejected because of a low RRF in this calibration. Dichlorodifluoromethane was not detected in the two associated samples. 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 2/10/97 at 10:55 on instrument N for the following compounds:

acrolein	0.042
acetonitrile	0.036

isobutyl alcohol	0.009
1,4-dioxane	0.002

The non-detect result for acrolein in associated sample 559HW03D04 was rejected (R). The non-detect results for the three other compounds were previously rejected because of low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 2/10/97 at 10:55 for the following compounds:

bromoform	43.2%
acrolein	65.9%
isobutyl alcohol	28.6%
dichlorodifluoromethane	50.4%

The non-detect results for bromoform and dichlorodifluoromethane in associated sample 559HW03D04 were flagged as estimated (UJ). The non-detect results for acrolein and isobutyl alcohol in this sample were previously rejected because of low RRF's in this calibration and the initial calibration.

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 2/13/97 at 10:19 on instrument N for the following compounds:

trans-1,4-dichloro-2-butene	0.044
acetonitrile	0.032
isobutyl alcohol	0.008
1,4-dioxane	0.002

The non-detect results for these compounds in associated sample GDEHW00504 were previously rejected because of low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 2/13/97 at 10:19 for the following compounds:

acrolein	65.9%
dichlorodifluoromethane	50.4%

The non-detect result for dichlorodifluoromethane in associated sample GDEHW00504 was flagged as estimated (UJ). The non-detect result for acrolein in this sample was previously rejected because of a low RRF in the initial calibration.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

Acetone was detected at 19 ug/L and 8 ug/L, respectively, in deionized water blank GDEDW00504 and equipment rinsate blank GDEEW00504, which were analyzed in SDG 28438B. 1,2-Dichloroethene was detected at 1 ug/L in field blank GDEFW00504, which was also analyzed in SDG 28438B. These two compounds were not detected in the two associated samples. No action was required.

Trip Blanks:

Chloroform was detected at 100 ug/L each in trip blanks 559TW03D04 and GDETW00504. In addition, bromodichloromethane was detected at 22 ug/L in trip blank 559TW03D04 and at 20 ug/L in trip blank GDETW00504. Both trip blanks were analyzed in SDG 28438B. Since the two compounds were not detected in the two associated samples, no action was taken.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the two sets of field duplicate samples in this SDG. No action was required.

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. 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 trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in both SDG samples because of low RRF's in the initial calibration. In addition, the non-detect result for acrolein in sample 559HW03D04 was rejected because of a low RRF in the associated continuing calibration. All other laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. 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) for the standards analyzed on 02/12/97 on instrument A exceeded the 30% QC limit for the following compounds:

2-picoline	30.5%
m-cresol	31.9%
n-nitrosopiperdine	35.2%
o,o,o-triethyl phosphorothioate	31.2%
2,6-dichlorophenol	35.0%
hexachloropropene	35.2%
n-nitrosodi-n-butylamine	32.2%
1,2,4,5-tetrachlorobenzene	34.8%
safrole	35.0%
isosafrole	35.9%
1,4-naphthoquinone	35.6%
1,3-dinitrobenzene	40.3%
pentachlorobenzene	32.4%
1-naphthylamine	37.1%
2-naphthylamine	33.3%

4-nitroquinoline-1-oxide	35.0%
thionazin	36.8%
diphenylamine	33.8%
sulfotep	37.1%
1,3,5-trinitrobenzene	31.2%
phorate	36.0%
phenacetin	38.7%
diallate	36.6%
dimethoate	35.9%
4-aminobiphenyl	34.1%
pronamide	40.4%
pentachloronitrobenzene	33.4%
disulfoton	32.5%
methyl parathion	38.6%
parathion	43.1%
isodrin	34.9%
kepone	44.9%
famphur	57.6%
acetamidofluorene	33.1%
7,12-dimethylbenz(a)anthracene	47.2%

These compounds were not detected in the two SDG samples. No action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.039) and hexachlorophene (0.030) were below the 0.050 QC limit for the standards analyzed on 2/13/97 at 09:40 on instrument A. The non-detect results for these two compounds in associated sample 559HW03D04 were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC for the standards analyzed on 2/13/97 at 09:40 on instrument A for the following compounds:

2,6-dichlorophenol	54.9%
hexachloropropene	52.3%
1,2,4,5-tetrachlorobenzene	51.9%
pyridine	34.5%
methyl methanesulfonate	47.1%
n-nitrosomethylethylamine	26.7%
o-toluidine	26.7%
o,o,o-triethyl phosphorothioate	28.2%
safrole	64.1%
isosafrole	51.6%
1,4-naphthoquinone	26.9%
1-naphthylamine	26.9%
2-naphthylamine	29.2%
4-aminobiphenyl	44.5%
pronamide	44.7%
pentachloronitrobenzene	82.1%

famphur	73.2%
m-cresol	34.3%
4-nitroquinoline-1-oxide	28.4%
diphenylamine	48.2%
sulfotep	52.6%
kepone	74.3%
1,3,5-trinitrobenzene	46.9%
hexachlorophene	44.2%
indeno(1,2,3-cd)pyrene	32.6%

The non-detect result for hexachlorophene was previously rejected because of a low RRF in this calibration. The results for the other compounds in associated sample 559HW03D04, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Relative Response Factor (RRF) for aramite (0.041) was below the 0.050 QC limit for the standards analyzed on 2/15/97 at 18:47 on instrument A. The non-detect result for aramite in associated sample GDEHW00504 was rejected (R).

The Percent Differences (%D's) exceeded the 25% QC for the standards analyzed on 2/15/97 at 18:47 on instrument A for the following compounds:

2,6-dichlorophenol	60.4%
hexachloropropene	62.5%
1,2,4,5-tetrachlorobenzene	68.1%
pyridine	30.3%
n-nitrosodimethylamine	27.9%
methyl methanesulfonate	45.5%
ethyl methanesulfonate	32.9%
2-picoline	43.4%
acetophenone	28,6%
n-nitrosopyrrolidine	35.7%
o-toluidine	43.3%
o,o,o-triethyl phosphorothioate	28.9%
n-nitrosopiperdine	41.0%
safrole	67.0%
isosafrole	50.6%
1,4-naphthoquinone	47.2%
1-naphthylamine	64.2%
2-naphthylamine	55.0%
4-aminobiphenyl	65.2%
phenacetin	54.4%
diallate	31.7%
dimethoate	49.8%
pronamide	64.5%
pentachloronitrobenzene	89.5%
famphur	30.9%

m-cresol	38.5%
methyl parathion	58.6%
parathion	74.0%
4-nitroquinoline-1-oxide	97.7%
acetamidofluorene	35.3%
diphenylamine	56.4%
sulfotep	68.8%
kepone	70.3%
1,3,5-trinitrobenzene	46.9%
p-phenylenediamine	28.5%
7,12-dimethylbenz(a)anthracene	55.9%
indeno(1,2,3-cd)pyrene	32.6%

All results for these compounds in associated sample GDEHW00504, 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 SBLK2. This compound was not detected in associated sample GDEHW00504. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 28438B. No action was necessary.

TIC's:

TIC's were not detected in the method or field blanks. No action was taken

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. Several LCS Recoveries were outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the two field duplicate sample pairs. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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 aramite and hexachlorophene were rejected in sample 559HW03D04 because of low RRF's in the associated continuing calibration. In addition, the non-detect result for aramite in sample GDEHW00504 was rejected because of a low RRF in the associated continuing calibration. 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 the secondary on 2/15/97 at 23:22 for the following compounds:

alpha-BHC	37.0%
beta-BHC	32.0%
gamma-BHC	39.0%
endrin	34.4%

The non-detect results for these compounds in sample GDEHW00504 were flagged as estimated (UJ).

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 28.8% for methoxychlor in the standards analyzed on the secondary column on 2/15/97, which exceeded the 20% QC limit. Since only one compound exceeded the QC limit, no action was required.

Continuing Calibration:

The Percent Differences (%D's) for alpha-BHC (26.2%) and endrin ketone (28.8%) exceeded the 25% QC limit for the standards analyzed on the secondary column on 2/15/97 at 23:50. The non-detect results for these two compounds in associated sample GDEHW00504 were flagged as estimated (UJ).

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 28438B. No 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 by the laboratory. All Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the one set of field duplicate samples. No

action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB3	antimony	2.80 ug/L	14.0 ug/L
CCB4	beryllium	0.40 ug/L	2.00 ug/L
FB	copper	2.50 ug/L	12.5 ug/L
ICB	magnesium	288 ug/L	1440 ug/L
ERB	nickel	0.91 ug/L	4.55 ug/L
FB	thallium	2.70 ug/L	13.5 ug/L
FB	zinc	18.2 ug/L	91.0 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
ERB = Equipment Rinsate Blank (GDEEW00504), FB = Field Blank (GDEFW00504)

Field Blanks (ERB and FB) were analyzed in SDG 28438B. 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, equipment rinsate or field 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	3 ug/L
arsenic	3 ug/L
cadmium	1 ug/L
cobalt	1 ug/L
copper	1 ug/L
chromium	3 ug/L
lead	2 ug/L
nickel	1 ug/L
selenium	6 ug/L
thallium	11 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.

A negative result was observed for arsenic (-3 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 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 fraction of the 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 necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples, 559HW03D04 / 559GW03D04 (analyzed in SDG 28438B) and GDEHW00504 / GDEGW00504 (analyzed in SDG 28438B), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	599HW03D04, ug/L	559GW03D04, ug/L	RPD
calcium	77500	76400	1.4%
iron	275	270	1.8%
magnesium	17800	17600	1.1%
manganese	141	138	2.2%
potassium	6970	6600	5.5%
sodium	130000	128000	1.6%

Analyte	GDEHW00504, ug/L	GDEGW00504, ug/L	RPD
calcium	152000	158000	3.9%
iron	3180	3320	4.3%
magnesium	27600	29300	5.6%
manganese	502	535	6.4%
potassium	96300	100000	3.8%
sodium	27600000	2890000	4.6%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 required.

Deionized Water Blank:

Chlorides were detected at 0.53 mg/L in deionized water blank GDEDW00504, which was analyzed in SDG 28438B. Since the detections of chlorides in the two associated samples exceeded 5X the blank amount, no action was necessary.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in these two field blanks, which were analyzed in SDG 28210B. No 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 1.8% for field duplicate samples 559HW03D04 and 559GW03D04 (analyzed in SDG 28438B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0.6% for field duplicate samples GDEHW00504 and GDEGW00504 (analyzed in SDG 28438B), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 28438B. 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0.6% for field duplicate samples 559HW03D04 and 559GW03D04 (analyzed in SDG 28438B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 1.5% for field duplicate samples GDEHW00504 and GDEGW00504 (analyzed in SDG 28438B), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 100 mg/L in deionized water blank GDEDW00504, 12 ug/L in equipment rinsate blank GDEEW00504 and 20 mg/L in field blank GDEFW00504, which were analyzed in SDG 28438B. Since the TDS detections in the two SDG samples were greater than 5X the highest blank amount, 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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 7.9% for field duplicate samples 559HW03D04 and 559GW03D04 (analyzed in SDG 28438B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for TDS was 2.0% for field duplicate samples GDEHW00504 and GDEGW00504 (analyzed in SDG 28438B), which was within the 30% QC limit for water samples. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28438B CLP Organics and Inorganics

SAMPLES: 559GW00304, 559GW00404, 559GW00504, 559GW00504DL, 559GW02D04, 559GW03D04, 559GW04D04, GDEGW00504, GDEGW02304, GDEGW02404, GDEGW23D04, GDEGW24D04, GDEGW24D04RE, GDEDW00504, GDEEW00504, GDEFW00504, 559TW03D04, GDETW00504, GDETW02404, GDEGW00404MS, GDEGW00404MSD

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) for carbon disulfide was 30.3% for the standard analyzed on 2/11/97 at 10:24 on instrument N. The non-detect results for carbon disulfide in the associated samples were flagged as estimated (UJ). The associated samples were 559GW00304, 559GW02D04, 559GW03D04, GDEGW02304 and GDEGW23D04.

IV.) Blanks:

Method Blanks:

There were no positive detections in the method blanks. No action was taken.

Field Blanks:

Acetone was detected at 19 ug/L and 8 ug/L, respectively, in deionized water blank GDEDW00504 and equipment rinsate blank GDEEW00504. 1,2-Dichloroethene was detected at 1 ug/L in field blank GDEFW00504. These two compounds were not detected in the associated samples. No action was

required.

Trip Blanks:

Chloroform was detected at 100 ug/L each in trip blanks 559TW03D04 and GDETW00504. In addition, bromodichloromethane was detected at 22 ug/L in trip blank 559TW03D04 and at 20 ug/L in trip blank GDETW00504. Since these two compounds were not detected in the associated samples, no action was taken.

TIC's:

TIC's were not detected in the method, field or trip blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the two sets of field duplicate samples in this SDG. No action was required.

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):

The concentration of chlorobenzene in sample 559GW00504 exceeded the linear standard calibration range. The dilution concentration in sample 559GW00504DL was transferred to the original analysis data on the spreadsheets with appropriate flagging (D).

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 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) for hexachlorocyclopentadiene was 49.7% for the standards analyzed on 2/13/97 on instrument P. This compound was not detected in the associated samples. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC for the standard analyzed on 2/18/97 at 10:08 on instrument V for the following compounds:

2,4-dinitrophenol	37.3%
2,4-dinitrotoluene	31.1%

The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 559GW00404, 559GW00504, 559GW04D04, GDEGW02404 and GDEGW24D04.

IV.) Blanks:

Method Blanks:

Bis(2-ethylhexyl)phthalate was detected at 5 ug/L in method blank SBLK2. 4-Bromophenylphenyl ether and isophorone were detected at 3 ug/L and 44 ug/L, respectively, in method blank SBLK3. There were no positive detections of these compound in the samples associated with each of the two method blanks. 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.

TIC's:

Methyl heptane and 2-bromo-6-methoxynaphthalene were detected in the method blanks. These two TIC's were not detected in the associated samples. No action was taken

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 32% for terphenyl-d14 in sample 559GW00304, which was below the 33-141% QC limits. Since only one surrogate was outside QC limits in the base/neutral fraction, no action was taken.

The Surrogate Percent Recovery (%R) was 128% for 2,4,6-tribromophenol in sample GDEGW23D04, which exceeded the 10-123% QC limits. Since only one surrogate was outside QC limits in the acid compound fraction, no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. Two Percent Recoveries were outside the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the two sets of field duplicate samples. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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 GDEGW24D04 was considered by the validator to be of preferable data quality as compared to the reanalysis because of its better holding time and internal standard performance. 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 the secondary column on 2/15/97 at 23:22 for the following compounds:

alpha-BHC	37.0%
beta-BHC	32.0%
gamma-BHC	39.0%
endrin	34.4%

The non-detect results for these compounds in sample GDEGW00504 were flagged as estimated (UJ).

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 28.8% for methoxychlor for the standards analyzed on the secondary column on 2/15/97, which exceeded the 20% QC limit. Since only one compound exceeded the QC limit, no action was required.

Continuing Calibration:

The Percent Differences (%D's) for heptachlor (30.0%) and methoxychlor (27.0%) exceeded the 25% QC limit for the standards analyzed on the primary column on 2/13/97 at 19:08. The non-detect results for these two compounds in associated samples GDEGW02404 and GDEGW24D04 were flagged as estimated (UJ).

The Percent Difference (%D) for dieldrin was 26.4%, which exceeded the 25% QC limit for the standards analyzed on the secondary column on 2/12/97 at 18:03. The non-detect results for this compound in associated samples GDEGW02304 and GDEGW23D04 were flagged as estimated (UJ).

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. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. Several LCS 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):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the one set of field duplicate samples. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Levell
CCB3	antimony	2.80 ug/L	14.0 ug/L
CCB4	beryllium	0.40 ug/L	2.00 ug/L
FB	copper	2.50 ug/L	12.5 ug/L
ICB	magnesium	288 ug/L	1440 ug/L
ERB	nickel	0.91 ug/L	4.55 ug/L
FB	thallium	2.70 ug/L	13.5 ug/L
FB	zinc	18.2 ug/L	91.0 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
ERB = Equipment Rinsate Blank (GDEEW00504), FB = Field Blank (GDEFW00504)

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, equipment rinsate or field 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	3 ug/L
arsenic	3 ug/L
cadmium	1 ug/L
cobalt	1 ug/L
copper	1 ug/L
chromium	3 ug/L
lead	2 ug/L
nickel	1 ug/L
selenium	6 ug/L
thallium	11 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.

A negative result was observed for arsenic (-3 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 sample 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 Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples, 559GW03D04 / 559HW03D04 (analyzed in SDG 28438A) and GDEGW00504 / GDEHW00504 (analyzed in SDG 28438A), were evaluated by the laboratory. None of the Relative Percent Differences (RPD's) exceeded the 30% QC limit for water samples, so no action was required. Refer to Section IX in SDG 28438A 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 required.

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.

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 required.

Deionized Water Blank:

Chlorides were detected at 0.53 mg/L in deionized water blank GDEDW00504. Since the detections of chlorides in the associated samples exceeded 5X the blank amount, no action was necessary.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in these two field blanks. No 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 1.8% for field duplicate samples 559GW03D04 and 559HW03D04 (analyzed in SDG 28438A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0.6% for field duplicate samples GDEGW00504 and GDEHW00504 (analyzed in SDG 28438A), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0.6% for field duplicate samples 559GW03D04 and 559HW03D04 (analyzed in SDG 28438A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 1.5% for field duplicate samples GDEGW00504 and GDEHW00504 (analyzed in SDG 28438A), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 100 mg/L in deionized water blank GDEDW00504, 12 ug/L in equipment rinsate blank GDEEW00504 and 20 mg/L in field blank GDEFW00504. The TDS detections in samples 559GW00304, 559GW00504 and GDEGW02404, which were less than 5X the highest blank amount, were flagged as undetected (U) with the detection limit being raised to the amount of contamination in each sample.

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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 7.9% for field duplicate samples 559GW03D04 and 559HW03D04 (analyzed in SDG 28438A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for TDS was 2.0% for field duplicate samples GDEGW00504 and GDEHW00504 (analyzed in SDG 28438A), which was within the 30% QC limit for water samples. No action was taken.

VIII.) 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:	0214
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHODS:	EPA SOW 3-90 / SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28482A (Level IV, Appendix IX) 28482B (Level III)

SAMPLES:

SDG 28482A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
GDEHW02504*	28483-01	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
GDEHW02504*	28483-01	Water	X	X	X	X

* = Corresponding sample GDEGW02504 was analyzed in SDG 28482B.

HW = FIELD DUPLICATE

SDG 28482B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
025GW00104	28519-01	Water	X		X	X
025GW00204	28519-02	Water	X		X	X
025GW00304	28506-01	Water	X		X	X
025GW00404	28506-02	Water	X		X	X
528GW00104	28519-04	Water				X
549GW00104	28506-03	Water	X			X
549GW00204	28506-04	Water	X			X
549GW00304	28519-03	Water	X			X
551GW00104	28482-01	Water				X
551GW00204	28482-02	Water				X
551GW02D04	28482-03	Water				X
GDEGW00204	28482-04	Water	X	X	X	X
GDEGW02504*	28482-08	Water	X	X	X	X
GDEGW02D04	28506-05	Water	X	X	X	X
GDEGW25D04	28482-05	Water	X	X	X	X
549TW00304	28519-05	Water	X			
GDETW02504	28482-09	Water	X			
GDETW02D04	28506-06	Water	X			
025GW00104MS	28519-01MS	Water	+			
025GW00104MSD	28519-01MSD	Water	+			
GDEGW25D04MS	28482-06MS	Water	+	+	+	+
GDEGW25D04MSD	28482-07MSD	Water	+	+	+	+

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
025GW00101	28519-01	Water		X	X	X
025GW00204	28519-02	Water		X	X	X
025GW00304	28506-01	Water		X	X	X
025GW00404	28506-02	Water		X	X	X
528GW00104	28519-04	Water		X	X	X
549GW00104	28506-03	Water		X	X	X
549GW00204	28506-04	Water		X	X	X
549GW00304	28519-03	Water		X	X	X
551GW00104	28482-01	Water		X	X	X
551GW00204	28482-02	Water		X	X	X
551GW02D04	28482-03	Water		X	X	X
GDEGW00204	28482-04	Water	X	X	X	X
GDEGW02504*	28482-08	Water	X	X	X	X
GDEGW02D04	28506-05	Water	X	X	X	X
GDEGW25D04	28482-05	Water	X	X	X	X
GDEGW25D04MS	28482-06MS	Water	+	+	+	+
GDEGW25D04MSD	28482-07MSD	Water	+	+	+	+

* = Corresponding field duplicate sample GDEHW02504 was analyzed in SDG 28482A.
+ = Non-billable QC analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, TW = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28482A Appendix IX, CLP Organics and Inorganics

SAMPLE: GDEHW02504

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 1/13/97 on instrument N for the following compounds:

trans-1,4-dichloro-2-butene	0.046
acetonitrile	0.036
isobutyl alcohol	0.007
1,4-dioxane	0.002

The non-detect results for these compounds in associated sample GDEHW02504 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for dichlorodifluoromethane and 1,4-dioxane were 71.8% and 60.9%, respectively, for the standards analyzed on 1/13/97 on instrument N, which were below the 30% QC limit. The non-detect result for 1,4-dioxane was previously rejected because of a low RRF in this calibration. Dichlorodifluoromethane was not detected in the associated sample. No further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 2/14/97 at 10:39 on instrument N for the following compounds:

trans-1,4-dichloro-2-butene	0.038
acetonitrile	0.033
isobutyl alcohol	0.008
1,4-dioxane	0.002

The non-detect results for these compounds in associated sample GDEHW02504 were previously rejected because of low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 2/14/97 at 10:39 for the following compounds:

acrolein	38.2%
dichlorodifluoromethane	65.4%

The non-detect results for these two compounds in associated sample 559HW02504 were flagged as estimated (UJ).

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Trip Blanks:

Trichloroethene was detected at 2 ug/L in trip blank 549TW00304, which was analyzed in SDG 28482B. This compound was not detected in associated sample GDEHW02504. No action was taken.

Chloroform and bromodichloromethane were detected at 110 ug/L and 21 ug/L, respectively, in trip blank GDETW02504, which was analyzed in SDG 28482B. These two compounds were not detected in associated sample GDEHW02504. No action was necessary.

Acetone and methylene chloride were detected at 9 ug/L and 11 ug/L, respectively, in trip blank GDETW02D04, which was analyzed in SDG 28482B. These two compounds were not detected in associated sample GDEHW02504. No action was necessary.

TIC's:

TIC's were not detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was required.

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. 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 trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample GDEHW02504 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 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) for the standards analyzed on 2/12/97 on instrument A exceeded the 30% QC limit for the following compounds:

2-picoline	30.5%
m-cresol	31.9%
n-nitrosopiperdine	35.2%
o,o,o-triethyl phosphorothioate	31.2%
2,6-dichlorophenol	35.0%
hexachloropropene	35.2%
n-nitrosodi-n-butylamine	32.2%
1,2,4,5-tetrachlorobenzene	34.8%
safrole	35.0%
isosafrole	35.9%
1,4-naphthoquinone	35.6%
1,3-dinitrobenzene	40.3%
pentachlorobenzene	32.4%
1-naphthylamine	37.1%
2-naphthylamine	33.3%
4-nitroquinoline-1-oxide	35.0%
thionazin	36.8%
diphenylamine	33.8%
sulfotep	37.1%
1,3,5-trinitrobenzene	31.2%
phorate	36.0%
phenacetin	38.7%
diallate	36.6%
dimethoate	35.9%
4-aminobiphenyl	34.1%
pronamide	40.4%
pentachloronitrobenzene	33.4%
disulfoton	32.5%
methyl parathion	38.6%
parathion	43.1%
isodrin	34.9%
kepone	44.9%
famphur	57.6%
acetamidofluorene	33.1%
7,12-dimethylbenz(a)anthracene	47.2%

These compounds were not detected in the SDG sample. No action was taken.

Continuing Calibration:

The Relative Response Factor (RRF) for aramite (0.041) was below the 0.050 QC limit for the standard analyzed on 2/18/97 at 18:47 on instrument A. The non-detect result for aramite in associated sample GDEHW03D04 was rejected (R).

The Percent Differences (%D's) exceeded the 25% QC for the standards analyzed on 2/18/97 at 18:47 on instrument A for the following compounds:

2,6-dichlorophenol	60.4%
1,2,4,5-tetrachlorobenzene	68.1%
pentachlorobenzene	51.9%
pyridine	30.3%
methyl methanesulfonate	45.5%
ethyl methanesulfonate	32.9%
n-nitrosodimethylamine	27.9%
2-picoline	43.4%
acetophenone	28.6%
n-nitrosopyrrolidine	35.7%
o-toluidine	43.3%
n-nitrosopiperdine	41.0%
o,o,o-triethyl phosphorothioate	28.9%
safrole	67.0%
isosafrole	50.6%
1,4-naphthoquinone	47.2%
n-nitrosodi-n-butylamine	35.2%
1,3-dinitrobenzene	77.2%
1-naphthylamine	64.2%
2-naphthylamine	55.0%
phenacetin	54.5%
diallate	31.7%
dimethoate	49.8%
4-aminobiphenyl	65.2%
pronamide	66.5%
pentachloronitrobenzene	89.5%
methyl parathion	58.4%
parathion	74.0%
famphur	30.9%
m-cresol	34.3%
4-nitroquinoline-1-oxide	97.7%
acetamidofluorene	35.3%
diphenylamine	56.4%
sulfotep	68.8%
kepone	70.3%
1,3,5-trinitrobenzene	36.8%
7,12-dimethylbenz9a)anthracene	55.9%
4-methylphenol	31.7%
p-phenylenediamine	28.5%
indeno(1,2,3-cd)pyrene	32.6%

All results for these compounds in associated sample GDEHW02504, 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 necessary.

TIC's:

TIC's were not detected in the method blank. No action was taken

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. One LCS Recovery exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the set of field duplicate samples. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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 result for aramite was rejected in sample GDEHW02504 because of a low RRF in the continuing calibration. 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 the secondary column on 2/15/97 at 23:22 for the following compounds:

alpha-BHC	37.0%
beta-BHC	32.0%
gamma-BHC	39.0%
endrin	34.4%

The non-detect results for these compounds in sample GDEHW02504 were flagged as estimated (UJ).

III.) Calibration:

Initial Calibration:

The Percent Relative Standard Deviation (%RSD) was 28.9% for methoxychlor for the standards analyzed on the secondary column on 2/15/97, which exceeded the 20% QC limit. Since only one compound exceeded the QC limit with a %D less than 30%, no action was required.

Continuing Calibration:

The Percent Differences (%D's) for alpha-BHC (26.2%) and endrin ketone (28.8%) exceeded the 25% QC limit for the standards analyzed on the secondary column on 2/15/97 at 23:50. The non-detect results for these two compounds in associated sample GDEHW02504 were flagged as estimated (UJ).

IV.) 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 required.

VI.) Laboratory Control Samples (LCS):

Two LCS's were analyzed by the laboratory. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the set of field duplicate samples in this SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	2.47 ug/L	12.4 ug/L
CCB1	barium	0.50 ug/L	2.50 ug/L
PBW	calcium	19.8 ug/L	99.0 ug/L
ICB	copper	0.70 ug/L	3.50 ug/L
PBW	tin	3.33 ug/L	16.7 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
PBW = Preparation Blank (Water)

All sample 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).

A negative result was observed for copper (-0.80 ug/L) in continuing calibration blank CCB4. The non-detect result for copper in sample GDEHW02504 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	5 ug/L
cadmium	1 ug/L
cobalt	1 ug/L
copper	1 ug/L
chromium	3 ug/L
lead	5 ug/L
selenium	5 ug/L
thallium	12 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.

A negative result was observed for barium (-1 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 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 fraction of the 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 necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples, GDEHW02504 / GDEGW02504 (analyzed in SDG 28482B), was evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEHW02504, ug/L	GDEGW02504, ug/L	RPD
calcium	102000	106000	3.8%
iron	387	375	3.1%
magnesium	13200	13600	3.0%
manganese	127	131	3.1%
mercury	0.26	0.26	0%
potassium	8280	8900	7.2%
sodium	22400	23600	5.2%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 15.9% for field duplicate samples GDEHW02504 and GDEGW02504 (analyzed in SDG 28482B), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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 blank. 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0.6% for field duplicate samples GDEHW02504 and GDEGW02504 (analyzed in SDG 28482B), which was within the 30% QC limit for water samples. No action was taken.

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.) Blank:

TDS was not detected in the method blank. 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:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 9.9% for field duplicate samples GDEHW02504

and GDEGW02504 (analyzed in SDG 28482B), which was within the 30% QC limit for water samples. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28482B CLP Organics and Inorganics

SAMPLES: 025GW00104, 025GW00204, 025GW00304, 025GW00404, 528GW00104, 549GW00104, 549GW00204, 549GW00304, 551GW00104, 551GW00204, 551GW02D04, GDEGW00204, GDEGW02504, GDEGW02D04, GDEGW25D04, 549TW00304, GDETW02504, GDETW02D04, 025GW00104MS, 025GW00104MSD, GDEGW25D04MS, GDEGW25D04MSD

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) for the standards analyzed on 2/12/97 on instrument R exceeded the 30% QC limit for the following compounds:

chloroethane	36.7%
acetone	30.5%
2-chloroethyl vinyl ether	39.3%

There were no positive detections of these compounds in the associated samples after blank qualifications. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) for trichloroethene was 28.5% for the standard analyzed on 2/19/97 at 09:46 on instrument N. The non-detect results (after blank qualifications) for trichloroethene in associated samples 025GW00104, 025GW00204 and 549GW00304 were flagged as estimated (UJ).

The Percent Difference (%D) for 2-chloroethyl vinyl ether was 35.4% for the standard analyzed on 2/20/97 at 11:04 on instrument R. The non-detect result for this compound in associated sample GDEGW02D04 was flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Trichloroethane was detected at 3 ug/L in method blank VBLK3. The detections of this compound in associated samples 025GW00104, 025GW00204 and 549GW00304, which were less than 5X the blank amount, were flagged as undetected (U), with analytical results below the CRQL being raised to the CRQL.

Trip Blanks:

Trichloroethane was detected at 2 ug/L in trip blank 549GW00304. The detections of this compound in associated samples 025GW00104, 025GW00204 and 549GW00304 were previously qualified based on the method blank. No further action was necessary.

Chloroform and bromodichloromethane were detected at 110 ug/L and 21 ug/L, respectively, in trip blank GDETW02504. There were no detections of these two compounds in the associated samples. No action was necessary.

Acetone and methylene chloride were detected at 9 ug/L and 11 ug/L, respectively, in trip blank GDETW25D04. All detections of these two compounds in associated samples 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 associated samples were 025GW00304, 025GW00404, 549GW00104, 549GW00204 and GDEGW02D04.

TIC's:

Phenol was detected in method blank VBLK3. This compound was not detected in the associated samples. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) of trichloroethene were 70% and 68%, respectively, in spiked samples 025GW00104MS and 025GW00104MSD, which were below the 71-120% QC limits. The non-detect result for this compound in unspiked sample 025GW00104 was previously qualified based on the associated continuing calibration. No further action was taken.

VII.) Laboratory Control Samples (LCS):

Eight LCS's were analyzed in this SDG. One LCS Recovery was below the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the set of field duplicate samples in this SDG. No action was required.

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. 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 three trip blanks were reported on the spreadsheets, but were not available in the electronic data files. All laboratory data were acceptable with qualifications.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. 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) for hexachlorocyclopentadiene was 49.7% for the standards analyzed on 2/13/97 on instrument P. This compound was not detected in the associated samples. No action was necessary.

Continuing Calibration:

The Percent Differences (%D's) exceeded the 25% QC for the standard analyzed on 2/18/97 at 10:34 on instrument P for the following compounds:

4-nitrophenol	27.9%
indeno(1,2,3-cd)pyrene	40.1%
dibenz(a,h)anthracene	39.8%
benzo(g,h,i)perylene	39.5%

The results for these compounds in associated sample GDEGW02D04, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC for the standard analyzed on 2/19/97 at 12:34 on instrument T for the following compounds:

benzoic acid	28.9%
4-nitrophenol	29.3%
hexachlorocyclopentadiene	28.9%

The results for these compounds in associated sample GDEGW00204, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Bis(2-ethylhexyl)phthalate was detected at 5 ug/L in method blank SBLK2. The detection of this compound in sample GDEGW02504, 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.

TIC's:

TIC's were not detected in the method blanks. No action was taken.

V.) Surrogate Recoveries:

The Surrogate Percent Recovery (%R) was 126% for 2,4,6-tribromophenol in sample GDEGW02D04, which exceeded the 10-123% QC limits. Since only one surrogate was outside QC limits in the acid compound fraction, no action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. One LCS Recovery exceeded the QC limits. Data validation action based on LCS recovery criteria was not required. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the set of field duplicate samples in this SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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.

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 PEM8H standard analyzed on the secondary column on 2/15/97 at 23:22 for the following compounds:

alpha-BHC	37.0%
beta-BHC	32.0%
gamma-BHC	39.0%
endrin	34.4%

The non-detect results for these compounds in associated samples GDEGW00204, GDEGW02504 and GDEGW25D04 were flagged as estimated (UJ).

The Percent Difference (%D) was 32.4% for methoxychlor, which exceeded the 25% QC limit for the PEM3X standard analyzed on the primary column on 2/18/97 at 17:49. The non-detect results for this compound in associated samples 025GW00304, 025GW00404 and GDEGW02D04 were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the PEM3Y standard analyzed on the secondary column on 2/21/97 at 00:19 for the following compounds:

alpha-BHC	29.0%
gamma-BHC	28.0%
endrin	28.4%

The non-detect results for these compounds in associated samples 025GW00104 and 025GW00204 were flagged as estimated (UJ).

III.) Calibration:

Initial Calibration:

All Initial Calibration criteria were met. No action was taken.

Continuing Calibration:

The Percent Differences (%D's) for alpha-BHC (26.8%) and endrin ketone (28.8%) exceeded the 25% QC limit for the standards analyzed on the secondary column on 2/15/97 at 23:50. The non-detect results for these two compounds in associated samples GDEGW02504, GDEGW02D04 and GDEGW25D04 were flagged as estimated (UJ).

The Percent Difference (%D) for methoxychlor was 30.7%, which exceeded the 25% QC limit for the standards analyzed on the primary column on 2/18/97 at 18:19. The non-detect results for this compound in associated samples 025GW00304, 025GW00404 and GDEGW02D04 were flagged as estimated (UJ).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on the secondary column on 2/21/97 at 00:49 for the following compounds:

delta-BHC	29.8%
heptachlor epoxide	26.3%
aldrin	29.8%
dieldrin	26.8%
endrin	26.4%
4,4'-DDD	28.0%
4,4'-DDT	26.5%
4,4'-DDE	27.2%
endosulfan II	28.0%
endosulfan sulfate	27.9%
endrin ketone	27.9%
alpha-chlordane	25.9%

The positive and non-detect results for these compounds in associated samples 025GW00104 and 025GW00204 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:

All Surrogate Recovery criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

Six LCS's were analyzed in this SDG. All LCS 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.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the one set of field duplicate samples in this SDG. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	antimony	2.47 ug/L	12.4 ug/L
CCB1	barium	0.50 ug/L	2.50 ug/L
PBW	calcium	19.8 ug/L	99.0 ug/L
ICB	copper	0.70 ug/L	3.50 ug/L
PBW	tin	3.33 ug/L	16.7 ug/L

ICB = Initial Calibration Blank, CCB = Continuing Calibration Blank,
PBW = Preparation Blank (Water)

All sample 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).

A negative result was observed for copper (-0.80 ug/L) in continuing calibration blank CCB4. All associated positive sample results less than 5X the absolute value of the negative blank result 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:

antimony	5 ug/L
cadmium	1 ug/L
cobalt	1 ug/L
copper	1 ug/L
chromium	3 ug/L
lead	5 ug/L
selenium	5 ug/L
thallium	12 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.

A negative result was observed for barium (-1 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:

All Serial Dilution Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

All MS / MSD Recovery criteria were met. No action was necessary.

IX.) Field Duplicates:

One set of field duplicate samples, GDEGW02504 / GDEHW02504 (analyzed in SDG 28482A), was evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEHW02504, ug/L	GDEGW02504, ug/L	RPD
calcium	102000	106000	3.8%
iron	387	375	3.1%
magnesium	13200	13600	3.0%
manganese	127	131	3.1%
mercury	0.26	0.26	0%
potassium	8280	8900	7.2%
sodium	22400	23600	5.2%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides 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):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 15.9% for field duplicate samples GDEGW02504 and GDEHW02504 (analyzed in SDG 28482A), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0.6% for field duplicate samples GDEGW02504 and GDEHW02504 (analyzed in SDG 28482A), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was 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.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 9.9% for field duplicate samples GDEGW02504 and GDEHW02504 (analyzed in SDG 28482A), which was within the 30% QC limit for water samples. 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
SERVICE ORDER NUMBER:	0216
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVEL:	EPA Level III
EPA METHODS:	EPA SOW 3-90 / SW-846
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, Total Metals, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBER:	28553 (Level III)

SAMPLES:

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Total Metals
063GW00104	28595-03	Water			X
063GW00204	28595-04	Water			X
067GW00104	28570-01	Water			X
067GW00204	28570-02	Water			X
070GW00104	28553-01	Water	X		X
070GW00204	28553-06	Water	X		X
070GW01D04	28553-05	Water	X		X
526GW00104	28582-01	Water			X
526GW00204	28595-01	Water			X
526GW01D04	28582-02	Water			X
542GW00104	28570-03	Water			X
542GW00204	28582-03	Water			X
542GW00304	28582-04	Water			X
542GW00404	28582-05	Water			X
543GW00104	28595-02	Water			X
070DW00104	28553-02	Water	X	X	X
070EW00104	28553-03	Water	X	X	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Total Metals
070FW00104	28553-04	Water	X	X	X
070TW00204	28553-07	Water	X		
070GW00104MS	28553-01MS	Water	+		
070GW00104MSD	28553-01MSD	Water	+		

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
063GW00104	28595-03	Water	X	X	X
063GW00204	28595-04	Water	X	X	X
067GW00104	28570-01	Water	X	X	X
067GW00204	28570-02	Water	X	X	X
070GW00104	28553-01	Water	X	X	X
070GW00204	28553-06	Water	X	X	X
070GW01D04	28553-05	Water	X	X	X
526GW00104	28582-01	Water	X	X	X
526GW00204	28595-01	Water	X	X	X
526GW01D04	28582-02	Water	X	X	X
542GW00104	28570-03	Water	X	X	X
542GW00204	28582-03	Water	X	X	X
542GW00304	28582-04	Water	X	X	X
542GW00404	28582-05	Water	X	X	X
543GW00104	28595-02	Water	X	X	X
070DW00104	28553-02	Water	X	X	X
070EW00104	28553-03	Water	X	X	X
070FW00104	28553-04	Water	X	X	X

+ = Non-billable QC analysis

DW = DEIONIZED WATER BLANK, E = EQUIPMENT RINSATE BLANK, F = FIELD BLANK
MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, T = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28553 CLP Organics and Inorganics

SAMPLES: 063GW00104, 063GW00204, 067GW00104, 067GW00204, 070GW00104, 070GW00204, 070GW01D04, 526GW00104, 526GW00204, 526GW01D04, 542GW00104, 542GW00204, 542GW00304, 542GW00404, 543GW00104, 070DW00104, 070EW00104, 070FW00104, 070TW00204, 070GW00104MS, 070GW00104MSD

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:

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:

Total xylene was detected at 4 ug/L in method blank VBLK1. The detections of this compound in associated samples 070GW00104, 070GW00204 and 070GW01D04, which were less than 5X the blank amount, were flagged as undetected (U), with analytical results below the CRQL being raised to the CRQL.

Deionized Water, Equipment Rinsate and Field Blanks:

Chloroform was detected at 2 ug/L, 2 ug/L and 1 ug/L, respectively, in the deionized water, equipment rinsate and field blank. The detection of chloroform in associated sample 070GW01D04 was flagged as undetected (U).

Total xylene was detected at 2 ug/L in each of the deionized water, equipment rinsate and field blanks. Qualification of this compound in the three associated samples were performed using the method blank. No further action was necessary.

Trip Blanks:

Total xylene was detected at 2 ug/L in trip blank 070TW00204. Qualification of this compound in the three associated samples were performed using the method blank. No further action was necessary.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method, field and trip blanks. No action was necessary.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed 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. 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 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 Calibration:

The Percent Difference (%D) was 43.1% for 2,4-dinitrophenol, which exceeded the 25% QC for the standard analyzed on 2/21/97 at 12:35 on instrument T. Since the only associated samples were field blanks, no action was required.

IV.) Blanks:

Method Blank:

There were no positive detections in the method blank. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no positive detections in the three field blanks. No action was required.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method or field blanks. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was necessary.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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 without qualification.

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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
DWB	aluminum	30.7 ug/L	154 ug/L
ICB	antimony	4.40 ug/L	22.0 ug/L
ERB	barium	0.39 ug/L	1.95 ug/L
DWB	chromium	1.70 ug/L	8.50 ug/L
ERB	copper	1.40 ug/L	7.00 ug/L
DWB	iron	35.8 ug/L	179 ug/L
DWB	manganese	0.31 ug/L	1.55 ug/L
FB	nickel	1.20 ug/L	6.00 ug/L
ERB	sodium	70.6 ug/L	353 ug/L
FB	thallium	5.00 ug/L	25.0 ug/L
PBW	vanadium	1.23 ug/L	6.15 ug/L
ERB	zinc	10.7 ug/L	53.4 ug/L

ICB = Initial Calibration Blank, PBW = Preparation Blank (Water),
DWB = Deionized Water Blank (070DW00104),
ERB = Equipment Rinsate Blank (070EW00104),
FB = Field Blank (070FW00104)

All sample 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 or field blank were flagged as undetected (U).

Negative results were observed for arsenic (-3.50 ug/L) and lead (-1.20 ug/L) in continuing calibration blank CCB3. All associated positive sample results less than 5X the absolute value of the negative blank result 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:

antimony	5 ug/L
cadmium	1 ug/L
cobalt	1 ug/L
copper	2 ug/L
chromium	2 ug/L
lead	1 ug/L
selenium	5 ug/L
thallium	8 ug/L
vanadum	1 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 nickel (-1 ug/L) and potassium (-213 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 Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples were not analyzed 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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:

Chlorides were not detected in the method blanks. No action was required.

Deionized Water Blank:

Chlorides were detected at 3.0 mg/L in deionized water blank 070DW00104. Detections of chlorides in the associated samples less than 5X the blank amount were flagged as undetected (U) with the quantitation limit being raised to the amount of contamination in each sample. The associated samples were 063GW00104, 067GW00204, 070GW00104, 070GW00204, 526GW00104, 526GW00204, 542GW00104, 542GW00304, 542GW00404 and 543GW00104.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in the equipment rinsate and field blanks. No 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

VII.) 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.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks. No 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 samples were not analyzed in this SDG. No action was required.

VI.) Field Duplicates:

Field duplicate samples were not analyzed in this SDG. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was not detected in the three field blanks. No action was taken.

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 SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

Field duplicate samples were not analyzed 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
SERVICE ORDER NUMBER:	0218
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHODS:	EPA SOW 3-90 / SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28621A (Level IV, Appendix IX) 28621B (Level III)

SAMPLES:

SDG 28621A (Level IV):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
065HW00404*	28636-01	Water	X		X	X
530HW01D04*	28636-02	Water	X	X		X
550DW00104	28622-01	Water	X	X	X	X
550EW00104	28622-02	Water	X	X	X	X
550FW00104	28622-03	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
065HW00404*	28636-01	Water	X	X	X
530HW01D04*	28636-02	Water	X	X	X
550DW00104	28622-01	Water	X	X	X
550EW00104	28622-02	Water	X	X	X
550FW00104	28622-03	Water	X	X	X

* = Corresponding samples 065GW00404 and 530GW01D04 were analyzed in SDG 28621B.

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK, FW = FIELD BLANK, HW = FIELD DUPLICATE

SDG 28621B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
023GW00104	28621-03	Water				X
023GW01D04	28621-04	Water				X
053GW00104	28621-05	Water				X
065GW00204	28635-01	Water	X		X	X
065GW00404*	28635-02	Water	X		X	X
065GW00504	28635-03	Water	X		X	X
530GW00104	28635-05	Water	X	X		X
530GW00204	28635-04	Water	X	X		X
530GW01D04*	28635-08	Water	X	X		X
538GW00104	28621-01	Water	X			X
538GW01D04	28621-02	Water	X			X
550GW00104	28621-06	Water				X
530TW01D04	28635-09	Water	X			
538TW00104	28621-09	Water	X			
530GW00104MS	28635-06MS	Water	+	+		+
530GW00104MSD	28635-07MSD	Water	+	+		+
550GW00104MS	28621-07MS	Water	+			+
550GW00104MSD	28621-08MSD	Water	+			+

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
023GW00104	28621-03	Water	X	X	X
023GW01D04	28621-04	Water	X	X	X
053GW00104	28621-05	Water	X	X	X
065GW00204	28635-01	Water	X	X	X
065GW00404*	28635-02	Water	X	X	X
065GW00504	28635-03	Water	X	X	X
530GW00104	28635-05	Water	X	X	X
530GW00204	28635-04	Water	X	X	X
530GW01D04*	28635-08	Water	X	X	X
538GW00104	28621-01	Water	X	X	X
538GW01D04	28621-02	Water	X	X	X
550GW00104	28621-06	Water	X	X	X
530GW00104MS	28635-06MS	Water	+	+	
530GW00104MSD	28635-07MSD	Water	+	+	
550GW00104MS	28621-07MS	Water	+	+	
550GW00104MSD	28621-08MSD	Water	+	+	

* = Corresponding duplicate samples 065HW00404 and 530HW01D04 were analyzed in SDG 28621A.

+ = Non-billable QC analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, TW = TRIP BLANK

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

RELEASE SIGNATURE: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28621A Appendix IX, CLP Organics and Inorganics

SAMPLES: 065HW00404, 530HW01D04, 550DW00104, 550EW00104, 550FW00104

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 1/13/97 on instrument N for the following compounds:

trans-1,4-dichloro-2-butene	0.046
acetonitrile	0.036
isobutyl alcohol	0.007
1,4-dioxane	0.002

The non-detect results for these compounds in associated samples 065HW00404, 530HW01D04, deionized water blank 550DW00104, equipment rinsate blank 550EW00104 and field blank 550FW00104 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for dichlorodifluoromethane and 1,4-dioxane were 71.8% and 60.9%, respectively, for the standards analyzed on 1/13/97 on instrument N, which were below the 30% QC limit. The non-detect results for 1,4-dioxane were previously rejected because of a low RRF in this calibration. Dichlorodifluoromethane was not detected in the two associated samples. No further action was necessary.

Continuing Calibration:

The Relative Response Factors (RRF's) were below the 0.050 QC limit for the standards analyzed on 2/26/97 at 11:57 on instrument N for the following compounds:

acetonitrile	0.031
isobutyl alcohol	0.008
1,4-dioxane	0.002

The non-detect results for these compounds in the two associated samples and three field blanks were previously rejected because of low RRF's in the initial calibration. No further action was taken.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 2/26/97 at 11:57 for the following compounds:

bromoform	32.3%
acrolein	50.4%
trans-1,4-dichloro-2-butene	65.2%

The non-detect results for bromoform and acrolein in associated samples 065HW00404 and 530HW01D04 were flagged as estimated (UJ). The non-detect results for trans-1,4-dichloro-2-butene in the two samples were previously rejected because of low RRF's in the initial calibration. No further action was required.

IV.) Blanks:

Method Blank:

There were no detections in the method blank. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

Chloroform was detected at 1 ug/L in equipment rinsate blank 550EW00104. In addition, acetone was detected at 14 ug/L in field blank 550FW00104. Since these two compounds were not detected in the two associated samples, no action was necessary. There were no positive detections in the associated deionized water blank.

Trip Blanks:

There were no positive detections in the two trip blanks, which were analyzed in SDG 28621B. No action was taken.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable for the two sets of field duplicate samples in this SDG. No action was required.

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. 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 trans-1,4-dichloro-2-butene, acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in all SDG samples and field blanks 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. 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) was 0.044 for aramite for the standards analyzed on 2/25/97 on instrument A, which was below the 0.050 QC limit. The non-detect results for this compound in associated sample 530HW01D04, deionized water blank 550DW00104, equipment rinsate blank 550EW00104 and field blank 550FW00104 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) for the standards analyzed on 2/25/97 on instrument A exceeded the 30% QC limit for the following compounds:

n-nitrosodiethylamine	32.9%
n-nitrosomethylethylamine	35.1%
ethyl methansulfonate	39.0%
acetophenone	34.8%
n-nitrosopyrolidine	31.7%
n-nitrosomorpholine	35.0%
o-toluidine	35.4%
methapyriline	32.3%
chlorobenzilate	37.0%
3,3'-dimithylbenzidine	33.6%
m-cresol	31.9%
n-nitrosopiperdine	34.2%
o,o,o-triethyl phosphorothioate	33.8%
2,6-dichlorophenol	35.8%
hexachloropropene	34.5%
n-nitrosodi-n-butylamine	38.9%
1,2,4,5-tetrachlorobenzene	34.0%
safrole	34.1%
isosafrole	34.6%
1,4-naphthoquinone	37.8%
1,3-dinitrobenzene	43.3%
pentachlorobenzene	35.9%
1-naphthylamine	38.7%
2-naphthylamine	32.2%
4-nitroquinoline-1-oxide	35.0%
thionazin	41.5%
diphenylamine	33.8%
sulfotep	37.2%
1,3,5-trinitrobenzene	31.2%
phorate	43.0%
phenacetin	40.8%
diallate	37.8%
dimethoate	41.1%
4-aminobiphenyl	37.2%
pronamide	43.5%
pentachloronitrobenzene	40.8%

disulfoton	38.9%
methyl parathion	45.5%
parathion	49.4%
isodrin	35.9%
kepone	44.9%
famphur	45.8%
acetamidofluorene	39.6%
7,12-dimethylbenz(a)anthracene	47.2%

These compounds were not detected in associated sample 530HW01D04. No action was taken.

Continuing Calibration:

The Relative Response Factors (RRF's) for aramite (0.036) and hexachlorophene (0.033) were below the 0.050 QC limit for the standards analyzed on 2/27/97 at 09:09 on instrument A. The non-detect results for hexachlorophene in the three field blanks 550DW00104, 550EW00104 and 550FW00104 were rejected (R). The non-detect results for aramite in the three field blanks were previously rejected because of a low RRF in the initial calibration. No further action was necessary.

The Relative Response Factors (RRF's) for aramite (0.046) and hexachlorophene (0.030) were below the 0.050 QC limit for the standards analyzed on 3/4/97 at 09:05 on instrument A. The non-detect result for aramite in sample 065HW01D04 was previously rejected because of a low RRF in the initial calibration. The non-detect result for hexachlorophene in this sample was rejected (R).

The Percent Differences (%D's) exceeded the 25% QC for the standards analyzed on 3/4/97 at 09:05 on instrument A for the following compounds:

2-methylphenol	53.7%
2,6-dichlorophenol	53.7%
hexachloropropene	56.3%
1,2,4,5-tetrachlorobenzene	71.1%
2,4-dinitrophenol	37.6%
2-methyl-4,6-dinitrophenol	32.0%
pentachlorobenzene	41.4%
n-nitrosodimethylamine	31.9%
n-nitrosomethylethylamine	43.5%
methyl methanesulfonate	27.4%
ethyl methanesulfonate	47.4%
2-picoline	74.5%
acetophenone	49.2%
n-nitrosopyrrolidine	45.1%
n-nitrosomorpholine	38.5%
o-toluidine	47.7%
o,o,o-triethylphosphorothioate	35.5%
n-nitrosodi-n-butylamine	31.0%
n-nitrosopiperdine	35.5%
safrole	41.1%
isosafrole	54.5%

benzyl alcohol	34.2%
1,4-naphthoquinone	52.3%
1-naphthylamine	46.7%
2-naphthylamine	42.6%
4-aminobiphenyl	54.5%
thionazin	36.3%
phenacetin	57.2%
diallate	46.9%
dimethoate	33.9%
pronamide	26.6%
pentachloronitrobenzene	28.4%
famphur	36.2%
m-cresol	30.0%
isodrin	66.0%
diphenylamine	49.1%
sulfotep	27.4%
kepone	36.9%
4-methylphenol	35.9%
1,3,5-trinitrobenzene	44.0%
hexachlorophene	43.7%

The non-detect result for hexachlorophene in sample 530HW01D04 was previously rejected because of a low RRF in this calibration. All 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 detections in the method blanks. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no detections in the three field blanks. No action was necessary.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method or field blanks. No action was taken

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. Several LCS Recoveries exceeded the QC limits. Data validation action based on LCS criteria was not required. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the field duplicate sample pair. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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 aramite and hexachlorophene were rejected in sample 530HW01D04 and the three field blanks because of 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 Pesticides Instrument Performance criteria were met. 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 detections in the method blank. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no detections in the three field 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 by the laboratory. One LCS Percent Recovery exceeded 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):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the associated set of field duplicate samples. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB1	antimony	4.00 ug/L	20.0 ug/L
ERB	barium	0.70 ug/L	3.50 ug/L
DWB	chromium	1.90 ug/L	9.50 ug/L
ERB	nickel	1.50 ug/L	7.50 ug/L
DWB	sodium	126 ug/L	630 ug/L
ERB	thallium	5.70 ug/L	28.5 ug/L

CCB = Continuing Calibration Blank, ERB = Equipment RinsateBlank (550EW00104), DWB = Deionized Water Blank (550DW00104)

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, equipment rinsate or deionized water 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	magnesium	-43.9 ug/L	220 ug/L
CCB4	silver	-1.80 ug/L	9.00 ug/L

CCB = Continuing Calibration Blank

The associated positive sample results were greater than 5X the absolute value of the negative blank results. The 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:

antimony	8 ug/L
arsenic	3 ug/L
cobalt	1 ug/L
copper	3 ug/L
lead	2 ug/L
selenium	6 ug/L
thallium	14 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 arsenic (-3 ug/L) and potassium (-170 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:

Serial Dilution Analysis was not performed in this fraction of the 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 fraction of the SDG. No action was necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this SDG. No action was necessary.

IX.) Field Duplicates:

Two sets of field duplicate samples, 065HW00404 / 065GW00404 (analyzed in SDG 28621B) and 530HW01D04 / 530GW01D04 (analyzed in SDG 28621B), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	065GW00404, ug/L	065HW00404, ug/L	RPD
calcium	24500	26300	7.1%
iron	151	152	0.7%
manganese	22.9	24.3	5.9%
sodium	11300	12000	6.0%

Analyte	530GW01D04, ug/L	530HW01D04, ug/L	RPD
calcium	62500	61600	1.5%
iron	154	144	6.7%
magnesium	8260	8150	1.3%
manganese	58.2	57.5	1.2%
sodium	112000	109000	2.6%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 required.

Deionized Water Blank:

Chlorides were detected at 0.25 mg/L in deionized water blank 550DW00104. Since the detections of chlorides in the two associated samples exceeded 5X the blank amount, no action was necessary.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in these two field blanks. No 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 samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 11.1% for field duplicate samples 065HW00404 and 065GW00404 (analyzed in SDG 28621B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0.8% for field duplicate samples 530HW01D04 and 530GW01D04 (analyzed in SDG 28621B), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met, so no action was necessary.

V.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for sulfates was 0% for field duplicate samples 065HW00404 and 065GW00404 (analyzed in SDG 28621B), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for sulfates was 1.2% for field duplicate samples 530HW01D04 and 530GW01D04 (analyzed in SDG 28621B), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 72 mg/L each in deionized water blank 550DW00104 and equipment rinsate blank 550DW00104. The detection of TDS in sample 065HW00404, which was less than 5X the blank amounts, was flagged as undetected (U) with the quantitation limit being raised to the amount of

contamination in the sample. TDS was also detected at 60 mg/L in field blank 550FW00104. Since the deionized water and equipment rinsate blanks were used for blank qualification, no further action was taken.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 0% for field duplicate samples 530HW01D04 and 530GW01D04 (analyzed in SDG 28621B), which was within the 30% QC limit for water samples. RPD was not calculable for TDS in the other set of field duplicate samples. No action was taken.

VIII.) Overall Assessment of Data/General:

All laboratory data were acceptable with qualification.

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28621B CLP Organics and Inorganics

SAMPLES: 023GW00104, 023GW01D04, 053GW00104, 065GW00204, 065GW00404, 065GW00504, 530GW00104, 530GW00204, 530GW01D04, 538GW00104, 538GW01D04, 550GW00104, 530TW01D04, 538TW00104, 530GW00104MS, 530GW00104MSD, 550GW00104MS, 550GW00104MSD

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:

All Initial Calibration criteria were met. No action was necessary.

Continuing Calibration:

The Percent Difference (%D) for bromoform was 32.3% for the standard analyzed on 2/26/97 at 11:57 on instrument N. The non-detect results for bromoform in the associated samples were flagged as estimated (UJ). The associated samples were 065GW00404, 065GW00504, 538GW00104 and 538GW01D04.

IV.) Blanks:

Method Blanks:

Total xylene was detected at 2 ug/L in method blank VBLK1. This compound was not detected in the associated samples. No action was taken.

Chloroform and total xylene were detected at 1 ug/L and 2 ug/L in method blank VBLK2. These compounds were not detected in the associated samples. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Chloroform was detected at 1 ug/L in equipment rinsate blank 550EW00104, which was analyzed in SDG 28621A. In addition, acetone was detected at 14 ug/L in field blank 550FW00104, which was analyzed in SDG 28621A. Since these two compounds were not detected in the associated samples, no action was necessary. There were no positive detections in the associated deionized water blank.

Trip Blanks:

There were no positive detections in the two trip blanks. No action was taken.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the two sets of field duplicate samples in this SDG. No action was required.

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. 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 taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blank:

There were no detections in the method blank. No action was taken.

Deionized Water, Equipment Rinsate and Field Blanks:

There were no detections in the three field blanks, which were analyzed in SDG 28621A. No action was necessary.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the set of field duplicate samples. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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 without qualification.

PESTICIDES/PCB's

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 taken.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was required.

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, which were analyzed in SDG 28621A. No 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. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Relative Percent Differences (RPD's) were not calculable in the set of field duplicate samples. No action was necessary.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) 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:

All Initial and Continuing Calibration criteria were met. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB1	antimony	4.00 ug/L	20.0 ug/L
ERB	barium	0.70 ug/L	3.50 ug/L
DWB	chromium	1.90 ug/L	9.50 ug/L
ERB	nickel	1.50 ug/L	7.50 ug/L
DWB	sodium	126 ug/L	630 ug/L
ERB	thallium	5.70 ug/L	28.5 ug/L

CCB = Continuing Calibration Blank, ERB = Equipment RinsateBlank (550EW00104), DWB = Deionized Water Blank (550DW00104)

The deionized water and equipment rinsate blanks were analyzed in SDG 28621A. 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, equipment rinsate or deionized water 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	magnesium	-43.9 ug/L	220 ug/L
CCB4	silver	-1.80 ug/L	9.00 ug/L

CCB = Continuing Calibration Blank

All associated positive sample results were greater than 5X the absolute value of the negative blank results. 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:

antimony	8 ug/L
arsenic	3 ug/L
cobalt	1 ug/L
copper	3 ug/L
lead	2 ug/L
selenium	6 ug/L
silver	11 ug/L
thallium	14 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 arsenic (-3 ug/L) and potassium (-215 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 Analysis 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:

Duplicate Sample Analysis was not performed in this SDG. No action was necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) were 128% and 132% for calcium and 142% and 142% for iron, respectively, in spiked samples 530GW00104MS and 530GW00104MSD. These recoveries were above the 75-125% QC limits. The positive results for these two analytes in the associated samples were flagged as estimated (J). The associated samples were 065GW00204, 065GW00404, 065GW00504, 530GW00104, 530GW00204 and 530GW01D04. All Recovery criteria were met for the second set of MS / MSD samples. No further action was required.

IX.) Field Duplicates:

Two sets of field duplicate samples, 065GW00404 / 065HW00404 (analyzed in SDG 28621A) and 530GW01D04 / 530HW01D04 (analyzed in SDG 28621A), were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	065GW00404, ug/L	065HW00404, ug/L	RPD
calcium	24500	26300	7.1%
iron	151	152	0.7%
manganese	22.9	24.3	5.9%
sodium	11300	12000	6.0%

Analyte	530GW01D04, ug/L	530HW01D04, ug/L	RPD
calcium	62500	61600	1.5%
iron	154	144	6.7%
magnesium	8260	8150	1.3%
manganese	58.2	57.5	1.2%
sodium	112000	109000	2.6%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 required.

Deionized Water Blank:

Chlorides were detected at 0.25 mg/L in deionized water blank 550DW00104, which was analyzed in SDG 28621A. Since the detections of chlorides in the associated samples exceeded 5X the blank amount, no action was necessary.

Equipment Rinsate and Field Blanks:

Chlorides were not detected in these two field blanks, which were analyzed in SDG 28621A. No 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):

All MS / MSD criteria were met. No action was required.

VI.) Field Duplicates:

The Relative Percent Difference (RPD) for chlorides was 11.1% for field duplicate samples 065GW00404 and 065HW00404 (analyzed in SDG 28621A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for chlorides was 0.8% for field duplicate samples 530GW01D04 and 530HW01D04 (analyzed in SDG 28621A), which was within the 30% QC limit for water samples. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

Sulfates were not detected in the three field blanks, which were analyzed in SDG 28621A. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS 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 was 0% for field duplicate samples 065GW00404 and 065HW00404 (analyzed in SDG 28621A), which was within the 30% QC limit for water samples. No action was taken.

The Relative Percent Difference (RPD) for sulfates was 1.2% for field duplicate samples 530GW01D04 and 530HW01D04 (analyzed in SDG 28621A), which was within the 30% QC limit for water samples. No action was taken.

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:

TDS was not detected in the method blanks. No action was required.

Deionized Water, Equipment Rinsate and Field Blanks:

TDS was detected at 72 mg/L each in deionized water blank 550DW00104 and equipment rinsate blank 550DW00104, which were analyzed in SDG 28621A. The detections of TDS in samples 023GW00104, 065GW00404, 530GW00104, 530GW00204 and 538GW00104, which were less than 5X the blank amounts, were flagged as undetected (U) with the quantitation limit being raised to the amount of contamination in each sample. TDS was also detected at 60 mg/L in field blank 550FW00104, which was analyzed in SDG 28621A. Since the deionized water and equipment rinsate blanks were used for blank qualification, no further action was taken.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met, so no action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

The Relative Percent Difference (RPD) for TDS was 0% for field duplicate samples 530GW01D04 and 530HW01D04 (analyzed in SDG 28621A), which was within the 30% QC limit for water samples. RPD was not calculable for TDS in the other set of field duplicate samples. No action was taken.

VIII.) 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:	0220
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / Level IV
EPA METHODS:	EPA SOW 3-90 / SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28645A (Level IV, Appendix IX) 28645B (Level III)

SAMPLES:

SDG 28645A (Level IV):

Client Sample #	Lab Sample #	Matrix	Total Metals
054HW00204	28661-01	Water	X

H = FIELD DUPLICATE (Corresponding sample 054GW00204 was analyzed in SDG 28645B.)

SDG 28645B (Level III):

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
021GW00304	28645-05	Water				X
054GW00204*	28660-07	Water				X
065GW00104	28645-01	Water	X		X	X
065GW00304	28645-02	Water	X		X	X

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB's	Total Metals
065GW00604	28645-06	Water	X		X	X
065GW04D04	28645-05	Water	X		X	X
525GW00104	28645-03	Water				X
530GW02D04	28645-08	Water	X	X		X
539GW00104	28660-01	Water	X			X
539GW01D04	28660-02	Water	X			X
598GW00104	28645-09	Water			X	X
599GW00104	28660-04	Water			X	X
065TW00104	28645-10	Water	X			
539TW00104	28660-08	Water	X			
065GW00304MS	28645-03MS	Water	+		+	+
065GW00304MSD	28645-04MSD	Water	+		+	+
599GW00104MS	28660-05MS	Water			+	+
599GW00104MSD	28660-06MSD	Water			+	+

Client Sample #	Lab Sample #	Matrix	Chlorides	Sulfates	TDS
021GW00304	28645-05	Water	X	X	X
065GW00104	28645-01	Water	X	X	X
065GW00304	28645-02	Water	X	X	X
065GW00604	28645-06	Water	X	X	X
065GW04D04	28645-05	Water	X	X	X
525GW00104	28645-03	Water	X	X	X
530GW02D04	28645-08	Water	X	X	X
539GW00104	28660-01	Water	X	X	X
539GW01D04	28660-02	Water	X	X	X
598GW00104	28645-09	Water	X	X	X
599GW00104	28660-04	Water	X	X	X
065GW00304MS	28645-03MS	Water	+	+	
065GW00304MSD	28645-04MSD	Water	+	+	
599GW00104MS	28660-05MS	Water	+	+	
599GW00104MSD	28660-06MSD	Water	+	+	

* = Corresponding field duplicate sample 054HW00204 was analyzed in SDG 28645A.
+ = Non-billable QC analysis

MS = MATRIX SPIKE, MSD = MATRIX SPIKE DUPLICATE, TW = TRIP BLANK

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

RELEASE SIGNATURE: Jean M Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28645A Appendix IX, Inorganics

SAMPLE: 054HW00204

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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB1	antimony	2.50 ug/L	12.5 ug/L
CCB2	barium	0.30 ug/L	1.50 ug/L
PBW	copper	2.17 ug/L	10.9 ug/L
CCB2	silver	2.90 ug/L	14.5 ug/L
PBW	sodium	27.3 ug/L	137 ug/L
PBW	zinc	14.8 ug/L	74.0 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB1	arsenic	-2.30 ug/L	11.5 ug/L
PBW	selenium	-4.28 ug/L	21.4 ug/L

CCB = Continuing Calibration Blank, PBW = Preparation Blank (Water)

The non-detect results for these two analytes in associated sample 054HW00204 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:

antimony	6 ug/L
chromium	2 ug/L
cobalt	1 ug/L
copper	2 ug/L
lead	3 ug/L
silver	8 ug/L
thallium	7 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 arsenic (-5 ug/L) and potassium (-190 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 in this fraction of the 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 necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples 054GW00204 and 054HW00204 (analyzed in SDG 28645A) were evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	054GW00204, ug/L	054HW00204, ug/L	RPD
calcium	321000	334000	4.0%
iron	18000	18800	4.3%
magnesium	95400	99700	4.4%
manganese	421	438	4.0%
potassium	41100	42800	4.1%
sodium	690000	728000	5.4%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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 Laboratories of Oklahoma, Inc. - 28645B CLP Organics and Inorganics

SAMPLES: 021GW00304, 054GW00204, 065GW00104, 065GW00304, 065GW00604, 065GW04D04, 525GW00104, 530GW02D04, 539GW00104, 539GW01D04, 598GW00104, 599GW00104, 065TW00104, 539TW00104, 065GW00304MS, 065GW00304MSD, 599GW00104MS, 599GW00104MSD

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:

All Initial and Continuing Calibration criteria were met. No action was taken.

IV.) Blanks:

Method Blanks:

Chloroform and total xylene were detected at 1 ug/L and 2 ug/L in method blank VBLK1. The detection of chloroform in associated sample 065GW00304, which was less than 5X the blank amount, was flagged as undetected (U) with the analytical result below the CRQL being raised to the CRQL. Total xylene was not detected in the associated samples. No further action was necessary.

Total xylene was detected at 1 ug/L in method blank VBLK2. Xylene was not detected in the associated samples. No action was taken.

Trip Blanks:

There were no detections in the two trip blanks. No action was taken.

Tentatively Identified Compounds (TIC's):

TIC's were not detected in the method or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met, so no action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

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. 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 one qualification.

SEMIVOLATILE ORGANICS

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) GC / MS Tuning:

All GC / MS Tuning criteria were met, so no action was required.

III.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was necessary.

IV.) Blanks:

Method Blank:

There were no detections of target compounds in the method blank. No action was taken.

Tentatively Identified Compounds (TIC's):

3-Penten-2-ol was detected in the method blank at a sufficient concentration to eliminate the compound's detection in sample 530GW02D04. Data validation action based on TIC criteria was not required. No action was taken.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was necessary.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VIII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was required.

IX.) Internal Standards Performance (ISTD):

All Internal Standard 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. 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 without qualification.

PESTICIDES/PCB's

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 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 standards analyzed on the primary and secondary columns on 3/3/97 at 20:38 for the following compounds:

Compound	%D Column 1	%D Column 2
alpha-BHC		35.4
beta-BHC		42.1
gamma-BHC		35.6
delta-BHC		36.4
dieldrin	28.9	47.5
endrin	37.0	
4,4'-DDD	28.9	
4,4'-DDE	25.8	52.4
4,4'-DDT		28.7
methoxychlor	30.2	34.7
endosulfan II		26.3
endosulfan sulfate		28.4
endrin ketone	26.0	39.3

Compound	%D Column 1	%D Column 2
endrin aldehyde	27.2	41.9

All results for these compounds in associated sample 599GW00104, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

There were no positive detections in the method blanks. No action was required.

V.) Surrogate Recoveries:

The Surrogate Percent Recoveries (%R's) of decachlorobiphenyl (DCB) were 20% on both the primary and secondary columns for sample 065GW00304, which were below the 30-150% QC limits. All results for this sample, which consisted entirely of non-detects, were flagged as estimated (UJ).

VI.) Laboratory Control Samples (LCS):

Four LCS's were analyzed in this SDG. All LCS Recovery criteria were met. No action was taken.

VII.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Percent Recoveries (%R's) were below the QC limits for spiked samples 065GW00304MS and 065GW00304MSD for the following compounds:

Compound	MS, %R	MSD, %R	QC Limits
4,4'-DDE	28	35	70-122%
4,4'-DDD	62	61	70-133%
endosulfan I	37	27	46-134%
endosulfan II	27	26	41-149%

The non-detect results for these compounds in unspiked sample 065GW00304 were previously qualified based on low surrogate recoveries. No further action was necessary.

The Percent Recoveries (%R's) were below the QC limits for spiked samples 599GW00104MS and 599GW00104MSD for the following compounds:

Compound	MS, %R	MSD, %R	QC Limits
4,4'-DDD	68	65	70-133%
4,4'-DDE		67	70-122%

The non-detect results for these two compounds in unspiked sample 599GW00104 were previously qualified based on high %D's in the associated continuing calibration. No further action was required.

VIII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

IX.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

X.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cartridge Check results were not included in the data package. No action was taken.

Gel Permeation Chromatography (GPC):

GPC cleanup was not required in this SDG. No action was necessary.

XI.) 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. No action was necessary.

III.) Blanks:

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

Blank Type/ID#	Analyte	Max. Conc.	Action Level
CCB1	antimony	2.50 ug/L	12.5 ug/L
CCB2	barium	0.30 ug/L	1.50 ug/L
PBW	copper	2.17 ug/L	10.9 ug/L
CCB7	magnesium	43.6 ug/L	218 ug/L
CCB2	silver	2.90 ug/L	14.5 ug/L
PBW	sodium	37.5 ug/L	188 ug/L

Blank Type/ID#	Analyte	Max. Conc.	Action Level
PBW	zinc	14.8 ug/L	74.0 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:

Blank Type/ID#	Analyte	Neg. Conc.	5X Conc.
CCB1	arsenic	-2.30 ug/L	11.5 ug/L
PBW	selenium	-4.28 ug/L	21.4 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 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:

antimony	7 ug/L
chromium	3 ug/L
cobalt	1 ug/L
copper	2 ug/L
lead	3 ug/L
silver	8 ug/L
thallium	7 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 arsenic (-5 ug/L) and potassium (-826 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 Serial Dilution Percent Differences (%D's) for chromium (14.5%) and iron (15.9%) exceeded the

10% QC limit in dilution sample 065GW00304L. All detections of these analytes in the associated samples were flagged as estimated (J). The associated samples were 021GW00304, 065GW00104, 065GW00304, 065GW00604, 065GW04D04, 530GW02D04 and 598GW00104. All criteria were met for the second Serial Dilution sample (599GW00104L). No further 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 in this SDG. No action was necessary.

VIII.) Matrix Spike/Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was taken.

IX.) Field Duplicates:

One set of field duplicate samples, 054GW00204 / 054HW00204 (analyzed in SDG 28645A), was evaluated by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	054GW00204, ug/L	054HW00204, ug/L	RPD
calcium	321000	334000	4.0%
iron	18000	18800	4.3%
magnesium	95400	99700	4.4%
manganese	421	438	4.0%
potassium	41100	42800	4.1%
sodium	690000	728000	5.4%

None of the RPD's exceeded 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 necessary.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

CHLORIDES

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

Chlorides were not detected in the method blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Percent Recovery criteria were met. 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:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

SULFATES

I.) Holding Times:

All Holding Time criteria were met. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. 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 Recovery criteria were met. 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:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

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. No action was taken.

II.) Calibration:

All Initial and Continuing Calibration criteria were met. No action was taken.

III.) Blanks:

TDS was not detected in the method blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. No action was necessary.

V.) Duplicate Sample Analysis:

Duplicate Sample Analysis was not performed in this SDG. No action was taken.

VI.) Matrix Spike / Matrix Spike Duplicates (MS / MSD):

MS / MSD samples were not analyzed in this fraction of the SDG. No action was required.

VII.) Field Duplicates:

Field duplicate samples were not analyzed in this fraction of the SDG. No action was taken.

VIII.) 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:	0221
CONTRACTED LAB:	Southwest Laboratories of Oklahoma, Inc.
QA/QC LEVELS:	EPA Level III / IV
EPA METHODS:	EPA SOW 3-90 / SW-846
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, Chlorides, Sulfates, Total Dissolved Solids (TDS)
SDG NUMBERS:	28710A (Appendix IX, Level IV) 28710B (Level III)

SAMPLES:

SDG 28710A (LEVEL IV)

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB	Total Metals
GDEHW029A2*	28726.01	Water	X	X	X	X
GDEDW027A2	28711.01	Water	X	X	X	X
GDEEW027A2	28711.02	Water	X	X	X	X
GDEFW027A2	28711.03	Water	X	X	X	X
GDEHW029A2MS	28726.01MS	Water	+			
GDEHW029A2MSD	28726.01MSD	Water	+			

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
GDEHW029A2*	28726.01	Water	X	X	X	X
GDEDW027A2	28711.01	Water	X	X	X	X
GDEEW027A2	28711.02	Water	X	X	X	X
GDEFW027A2	28711.03	Water	X	X	X	X

* = Corresponding sample GDEGW029A2 was analyzed in SDG 28710B.

+ = Non-billable analysis

DW = DEIONIZED WATER BLANK, EW = EQUIPMENT RINSATE BLANK,
FW = FIELD BLANK, H = FIELD DUPLICATE, MS = MATRIX SPIKE,
MSD = MATRIX SPIKE DUPLICATE

SDG 28710B (LEVEL III)

Client Sample #	Lab Sample #	Matrix	Volatile Organics	Semi-volatiles	Pesticides/ PCB	Total Metals
065GW007A2	28742.01	Water	X	X	X	X
065GW008A2	28742.02	Water	X	X	X	X
570GW004A2	28742.03	Water	X	X	X	X
GDEGW026A2	28710.01	Water	X	X	X	X
GDEGW027A2	28710.04	Water	X	X	X	X
GDEGW028A2	28725.02	Water	X	X	X	X
GDEGW029A2*	28725.05	Water	X	X	X	X
GDEGW030A2	28742.02	Water	X	X	X	X
GDEGW030A2RE	28742.02RE	Water		+		
GDEGW26DA2	28710.02	Water	X	X	X	X
GDEGW27DA2	28710.03	Water	X	X	X	X
GDEGW28DA2	28725.03	Water	X	X	X	X
GDEGW29DA2	28725.04	Water	X	X	X	X
GDEGW2D1A2	28725.01	Water	X	X	X	X
GDEGW30DA2	28742.04	Water	X	X	X	X
GDEGW30DA2RE	28742.04RE	Water		+		
GDETW027A2	28710.05	Water	X			
GDETW029A2	28725.06	Water	X			
GDETW030A2	28742.08	Water	X			
GDEGW026A2MS	28710.01MS	Water	+			
GDEGW026A2MSD	28710.01MSD	Water	+			
GDEGW030A2MS	28742.02MS	Water	+	+	+	+
GDEGW030A2MD	28742.02MD	Water				+
GDEGW030A2MSD	28742.02MSD	Water	+	+	+	
GDEGW030A2RMS	28742.02RMS	Water		+		
GDEGW030A2RMSD	28742.02RMSD	Water		+		
GDEGW2D1A2MS	28725.01MS	Water		+	+	
GDEGW2D1A2MSD	28725.01MSD	Water		+	+	

Client Sample #	Lab Sample #	Matrix	Cyanide	Chlorides	Sulfates	TDS
065GW007A2	28742.01	Water	X	X	X	X
065GW008A2	28742.02	Water	X	X	X	X
570GW004A2	28742.03	Water	X	X	X	X
GDEGW026A2	28710.01	Water	X	X	X	X
GDEGW027A2	28710.04	Water	X	X	X	X
GDEGW028A2	28725.02	Water	X	X	X	X
GDEGW029A2*	28725.05	Water	X	X	X	X
GDEGW030A2	28742.02	Water	X	X	X	X

Client Sample #	Lab Sample #	Matrix	Cyanide	Chloride	Sulfate	TDS
GDEGW26DA2	28710.02	Water	X	X	X	X
GDEGW27DA2	28710.03	Water	X	X	X	X
GDEGW28DA2	28725.03	Water	X	X	X	X
GDEGW29DA2	28725.04	Water	X	X	X	X
GDEGW2D1A2	28725.01	Water	X	X	X	X
GDEGW30DA2	28742.04	Water	X	X	X	X
GDEGW030A2MS	28742.02MS	Water	+			
GDEGW030A2MD	28742.02MD	Water	+			

* = Corresponding field duplicate sample GDEHW029A2 was analyzed in SDG 28710A.
+ = Non-billable analysis

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: Jean M. Delashmit

Data Qualifier Definitions

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

DATA QUALIFICATION SUMMARY

Southwest Laboratories of Oklahoma, Inc. - 28710 Appendix IX Organics & Inorganics

SAMPLES: GDEHW029A2, GDEDW027A2, GDEEW027A2, GDEFW027A2

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 2/12/97 on instrument R for the following compounds:

acetonitrile	0.032
isobutyl alcohol	0.009
1,4-dioxane	0.002

The results for these compounds in the associated samples, which consisted entirely of non-detects, were rejected (R). The associated samples were GDEHW029A2 and blanks GDEDW027A2, GDEEW027A2 and GDEFW027A2.

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 2/12/97 on instrument R for the following compounds:

chloroethane	36.7%
2-chloroethyl vinyl ether	39.3%
isobutyl alcohol	63.4%
1,4-dioxane	31.6%
dichlorodifluoromethane	36.4%

There were no positive results for these compounds in the associated sample. No action was required.

Continuing Calibration:

The Relative Response Factors (RRF's) for the standards analyzed on 3/06/97 at 09:27 on instrument R were below the 0.050 QC limit for the following compounds:

acetonitrile	0.028
isobutyl alcohol	0.007
1,4-dioxane	0.002

The non-detect results for these compounds in the associated field blanks were previously rejected based on low RRF's in the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 3/06/97 at 09:27 on instrument R for the following compounds:

chloroethane	36.5%
acrolein	42.2%
ethyl methacrylate	28.5%
dichlorodifluoromethane	31.6%

Since the associated samples were field blanks, so no action was required.

The Relative Response Factors (RRF's) for the standards analyzed on 3/10/97 at 15:33 on instrument R were below the 0.050 QC limit for the following compounds:

acetonitrile	0.033
isobutyl alcohol	0.008
1,4-dioxane	0.002

The results for these compounds in associated sample GDEHW029A2 were previously rejected based on low RRF's in the initial calibration. No further action was required.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 3/10/97 at 15:33 on instrument R for the following compounds:

vinyl acetate	36.3%
2-chloroethyl vinyl ether	28.1%
acrolein	28.9%
trans-1,4-dichloro-2-butene	27.0%
dichlorodifluoromethane	60.7%

The results for these compounds in associated sample GDEHW029A2, which consisted entirely of non-detects, were flagged as estimated (UJ).

IV.) Blanks:

Method Blanks:

Acetone and methylene chloride were detected at 10 ug/L and 15 ug/L, respectively, in method blank VBLK3. The positive results for these compounds in associated sample GDEHW029A2, which were less than 10X the blank amounts, were flagged as undetected (U) with the detection limits being raised to the level of contamination in the sample.

Field Blanks:

Acetone, chloroform and methylene chloride were detected at 23 ug/L, 1 ug/L and 1 ug/L, respectively, in deionized water blank GDEDW027A2. There were no positive results for chloroform in the associated samples, so no action was required. The results for the other compounds were previously flagged based on the method blank. No further action was required.

Acetone, chloroform and methylene chloride were detected at 11 ug/L, 2 ug/L and 2 ug/L, respectively, in equipment rinsate blank GDEEW027A2. The results for these compounds were previously qualified based on the method and deionized water blanks. No further action was required.

Acetone and methylene chloride were detected at 11 ug/L and 2 ug/L, respectively, in field blank GDEFW027A2. The results for these compounds in the associated sample were previously flagged based on the method blank. No further action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. All LCS Recovery criteria were met. No action was taken.

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 required.

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 acetonitrile, isobutyl alcohol and 1,4-dioxane were rejected in sample GDEHW029A2 and field blanks GDEDW027A2, GDEEW027A2 and GDEFW027A2 based on 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, 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) was below the 0.050 QC limit for the standards analyzed on 3/07/97 on instrument A for aramite (0.044). The non-detect results for this compound in associated sample GDEHW029A2 and blanks GDEDW027A2, GDEEW027A2 and GDEFW027A2 were rejected (R).

The Percent Relative Standard Deviations (%RSD's) exceeded the 30% QC limit for the standards analyzed on 3/07/97 on instrument A for the following compounds:

n-nitrosomethylethylamine	35.1%
n-nitrosodiethylamine	32.9%
ethyl methanesulfonate	39.0%

acetophenone	34.8%
n-nitrosopyrrolidine	31.7%
m-cresol	31.9%
n-nitrosomorpholine	35.0%
o-toluidine	35.4%
n-nitroso-piperidine	34.2%
o,o,o-triethyl phosphorothionate	33.7%
2,6-dichlorophenol	35.2%
hexachloropropene	36.7%
n-nitroso-di-n-butylamine	38.9%
1,2,4,5-tetrachlorobenzene	32.9%
safrole	34.1%
isosafrole	34.5%
1,4-naphthoquinone	37.7%
1,3-dinitrobenzene	43.3%
pentachlorobenzene	33.7%
1-naphthylamine	38.7%
4-nitroquinoline-1-oxide	35.0%
2-naphthylamine	32.2%
thionazin	41.5%
diphenylamine	33.8%
sulfotepp	37.2%
1,3,5-trinitrobenzene	31.2%
phorate	42.9%
phenacetin	40.8%
diallate	37.7%
dimethoate	41.0%
4-aminobiphenyl	37.2%
pronamide	43.5%
pentachloronitrobenzene	40.8%
disulfoton	38.9%
methyl parathion	45.4%
parathion	49.4%
methapyrilene	32.3%
isodrin	35.9%
chlorobenzilate	37.0%
3,3'-dimethylbenzidine	33.6%
kepone	44.9%
famphur	45.8%
2-acetylaminofluorene	39.6%
7,12-dimethylbenz(a)anthracene	47.2%

These compounds were not detected in associated sample GDEHW029A2. No action was required.

Continuing Calibration:

The Relative Response Factor (RRF) for hexachlorophene was 0.029 for the standards analyzed on 3/11/97 at 07:16 on instrument A, which was below the 0.050 QC limit. The results for this

compound in associated sample GDEDW027A2 and field blanks GDEEW027A2, GDEFW027A2 and GDEHW029A2, which consisted entirely of non-detects, were rejected (R).

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 3/11/97 at 07:16 on instrument A for the following compounds:

2,6-dichlorophenol	61.3%
hexachloropropene	37.0%
1,2,4,5-tetrachlorobenzene	57.9%
pentachlorobenzene	53.8%
methyl methanesulfonate	25.7%
n-nitrosodiethylamine	75.1%
ethyl methansulfonate	44.2%
2-picoline	54.7%
acetophenone	48.8%
n-nitrosopyrrolidine	58.8%
n-nitrosomorpholine	46.3%
o-toluidine	46.6%
n-nitroso-piperidine	59.6%
o,o,o-triethyl phosphorothionate	42.7%
n-nitrosodi-n-butylamine	58.2%
safrole	50.4%
isosafrole	49.6%
1,4-naphthoquinone	60.2%
1,3-dinitrobenzene	35.3%
2-naphthylamine	49.2%
thionazin	42.4%
phorate	45.0%
phenacetin	62.0%
diallate	60.6%
dimethoate	45.9%
4-aminobiphenyl	58.5%
pronamide	48.9%
pentachloronitrobenzene	52.3%
disulfoton	46.5%
methyl parathion	49.9%
parathion	55.3%
isodrin	74.0%
3,3'-dimethylbenzidine	42.7%
famphur	33.5%
m-cresol	33.0%
4-nitroquinoline-1-oxide	66.7%
diphenylamine	50.2%
kepone	62.8%
7,12-dimethylbenz(a)anthracene	31.3%
4-methylphenol	32.1%
1,3,5-trinitrobenzene	36.4%
hexachlorophene	45.1%

The non-detect result for hexachlorophene was previously rejected. The results for the other compounds in associated sample GDEHW029A2, 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 three field blanks. No action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed for this fraction of the SDG. No action was taken.

VII.) Laboratory Control Samples (LCS):

Two LCS's were analyzed for this SDG. Several Percent Recoveries (%R's) were outside the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

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 required.

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 aramite and hexachlorophene in sample GDEHW029A2 and field blanks GDEEW027A2, GDEFW027A2 and GDEDW027A2 were rejected (R) because of 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 Instrument Performance criteria were met. No 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 field and method blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

MS / MSD analyses were not performed in this fraction of the SDG. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS Identification criteria were met. No action was required.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences for the field duplicate samples in this fraction of the SDG. No action was required.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cleanup data were not submitted for this SDG. No action was taken.

Gel Permeation Chromatography (GPC):

GPC data was not required for this SDG. No action was taken.

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:

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 sample and were used for data qualification:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
GDEFW027A2	aluminum	10.4 ug/L	52.0 ug/L
ICB	antimony	3.10 ug/L	15.5 ug/L
GDEFW027A2	barium	0.32 ug/L	1.60 ug/L
GDEDW027A2	cadmium	1.30 ug/L	6.50 ug/L
GDEEW027A2	chromium	1.10 ug/L	5.50 ug/L
PBW	lead	4.27 ug/L	21.4 ug/L
GDEFW027A2	nickel	0.74 ug/L	3.70 ug/L
GDEEW027A2	silver	1.00 ug/L	5.00 ug/L
GDEEW027A2	sodium	88.0 ug/L	440 ug/L
GDEEW027A2	zinc	9.00 ug/L	45.0 ug/L

PBW = Preparation Blank (Water), GDEDW027A2 = Deionized Water Blank, GDEEW027A2 = Equipment Rinsate Blank, GDEFW027A2 = Field 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, preparation or field 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.
CCB2	barium	-0.30 ug/L	1.50 ug/L
CCB4	beryllium	-0.20 ug/L	1.00 ug/L
PBW	copper	-1.49 ug/L	7.45 ug/L
CCB2	silver	-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 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:

antimony	10 ug/L
chromium	2 ug/L
cobalt	1 ug/L
copper	2 ug/L
lead	3 ug/L
selenium	7 ug/L
silver	7 ug/L
thallium	7 ug/L

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

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

arsenic	-4 ug/L
barium	-1 ug/L
potassium	-200 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration

comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

Serial dilution analysis was not performed in this fraction of the SDG. No action was required.

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 fraction of the SDG. No action was required.

VIII.) Matrix Spike Recoveries:

Matrix Spike Analysis was not performed in this fraction of the SDG. No action was required.

IX.) Field Duplicates:

One set of field duplicate samples, GDEGW029A2 (analyzed in SDG 28710B) and GDEHW029A2, was analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEGW029A2, ug/L	GDEHW029A2, ug/L	RPD
aluminum	257	288	11%
calcium	29600	32400	9.0%
iron	8910	9790	9.4%
magnesium	15400	17100	11%
manganese	45.2	49.3	8.7%
potassium	10800	11300	4.5%
sodium	56300	52000	7.9%

None of the Relative Percent Differences (RPD's) exceeded 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 required.

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.

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.

Field Blanks:

Chlorides were not detected in the three field blanks. No action was required.

IV.) Laboratory Check Samples (LCS):

All LCS 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 chloride in field duplicate samples GDEGW029A2 (analyzed in SDG 28710B) and GDEHW029A2 was 0.9%, which was less than the 30% QC limit for water samples. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was necessary.

Field Blanks:

Sulfates were not detected in the three field blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS 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 sulfates in field duplicate samples GDEGW029A2 (analyzed in SDG 28710B) and GDEHW029A2 was 0%, which was less than 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.

Field Blanks:

There were no positive detections in the three field blanks. No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS 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 TDS in field duplicate samples GDEGW029A2 (analyzed in SDG 28710B) and GDEHW029A2 was 2.9%, which was less than 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 Laboratories of Oklahoma, Inc. - 28710 CLP Organics and Inorganics

SAMPLES: 065GW007A2, 065GW008A2, 570GW004A2, GDEGW026A2, GDEGW027A2, GDEGW028A2, GDEGW029A2, GDEGW030A2, GDEGW030A2RE, GDEGW26DA2, GDEGW27DA2, GDEGW28DA2, GDEGW29DA2, GDEGW2D1A2, GDEGW30DA2, GDEGW30DA2RE, GDETW027A2, GDETW029A2, GDETW030A2, GDEGW026A2MS, GDEGW026A2MSD, GDEGW030A2MS, GDEGW030A2MSD, GDEGW2D1A2MS, GDEGW2D1AMSD, GDEGW30DA2MS, GDEGW30DA2MD, GDEGW30DA2MSD

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 2/12/97 on instrument R for the following compounds:

chloroethane	36.7%
acetone	30.5%
2-chloroethyl vinyl ether	39.3%

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 standards analyzed on 3/06/97 at 09:27 on instrument R for chloroethane (36.5%). The results for this compound in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDEGW026A2, GDEGW26DA2, GDEGW27DA2 and GDEGW027A2.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 3/07/97 at

11:17 on instrument N for the following compounds:

vinyl acetate	82.3%
bromoform	31.2%
2-chloroethyl vinyl ether	59.9%

The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were GDEGW2D1A2, GDEGW028A2, GDEGW28DA2, GDEGW029A2 and GDEGW29DA2.

The Percent Differences (%D's) exceeded the 25% QC limit for the standards analyzed on 3/11/97 at 09:51 on instrument R for the following compounds:

vinyl acetate	32.4%
2-chloroethyl vinyl ether	28.1%

The results for these compounds in the associated samples, which consisted entirely of non-detects, were flagged as estimated (UJ). The associated samples were 065GW007A2, 065GW008A2, GDEGW30DA2, GDEGW030A2 and 570GW004A2.

IV.) Blanks:

Method Blanks:

Acetone and methylene chloride were detected at 5 ug/L and 3 ug/L, respectively, in method blank VBLK3. All positive results for these compounds in the associated samples, which were 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 065GW007A2, 065GW008A2, GDEGW30DA2, GDEGW030A2 and 570GW004A2.

Field Blanks:

Acetone, chloroform and methylene chloride were detected at 23 ug/L, 1 ug/L and 1 ug/L, respectively, in deionized water blank GDEDW027A2 (analyzed in SDG 28710A). There were no positive results for chloroform in the associated samples, so no action was required. The results for the other two compounds in the associated samples, which were 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 065GW007A2, 065GW008A2, 570GW004A2, GDEGW026A2, GDEGW027A2, GDEGW028A2, GDEGW029A2, GDEGW030A2, GDEGW26DA2, GDEGW27DA2, GDEGW28DA2, GDEGW29DA2, GDEGW2D1A2 and GDEGW30DA2.

Acetone, chloroform and methylene chloride were detected at 11 ug/L, 2 ug/L and 2 ug/L, respectively, in equipment rinsate blank GDEEW027A2 (analyzed in SDG 28710A). The results for these compounds were previously flagged based on the method and deionized water blanks. No further action was required.

Acetone and methylene chloride were detected at 11 ug/L and 2 ug/L, respectively, in field blank GDEFW027A2. The results for these compounds in the associated samples were previously flagged

based on the method and deionized water blanks. No further action was required.

Trip Blanks:

Methylene chloride was detected at 3 ug/L in trip blank GDETW030A3. The results for this compound in the associated samples were previously flagged based on the method and deionized water blanks. No further action was required.

TIC's:

There were no TIC's detected in the method, field or trip blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required

VII.) Laboratory Control Samples (LCS):

Three LCS's were analyzed for this SDG. Several Percent Recoveries (%R's) exceeded the QC limits. Data validation action based on LCS Recovery criteria was not required. No action was taken.

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 required.

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 required.

III.) Calibration:

All Initial and 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.

Field Blanks:

There were no positive detections in the three field blanks (analyzed in SDG 28710A). No action was required.

TIC's:

There were no TIC's detected in the method or field blanks. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

The Relative Percent Differences (RPD's) exceeded their respective QC limit for the spiked samples GDEGW030A2MS and GDEGW030A2MSD for the following compounds:

Compound	%R	QC Limit
phenol	102	42%
2-chlorophenol	74	40%
2,4-dinitrotoluene	56	38%
4-nitrophenol	179	50%
pentachlorophenol	133	50%

The results for these compounds in unspiked sample GDEGW030A2, which consisted entirely of non-detects, were flagged as estimated (UJ).

The Percent Recoveries (%R's) of 4-nitrophenol were outside the 10-80% QC limits for spiked samples GDEGW030A2MS (90%) and GDEGW030A2MSD (5%). The result for this compound in the associated sample was previously flagged. No further action was taken.

The Percent Recoveries (%R's) of 4-nitrophenol exceeded the 10-80% QC limits for spiked samples GDEGW2D1A2MS (85%) and GDEGW2D1A2MSD (82%). No action was taken, since this compound was not detected in unspiked sample GDEGW2D1A2.

VII.) Laboratory Control Samples (LCS):

Five LCS's were analyzed for 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.

VIII.) Field Duplicates:

There were no calculable Relative Percent Differences (RPD's) for the field duplicate samples in this fraction in this SDG. No action was required.

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 original analyses of samples GDEGW030A2 and GDEGW30DA2 were considered by the validator to be of preferable data quality to the reanalyses based on their better holding times. 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 required.

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 blanks. No action was required.

Field Blanks:

There were no positive detections in the three field blanks, which were analyzed in SDG 28710A. No action was required.

V.) Surrogate Recoveries:

All Surrogate Recovery criteria were met. No action was required.

VI.) Matrix Spike / Matrix Spike Duplicate (MS / MSD):

All MS / MSD criteria were met. No action was required.

VII.) TCL Compound Identification:

Pesticide/PCB Identification Summary (PIS):

All PIS 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 in the SDG. No action was necessary.

IX.) Pesticide Cleanup Check:

Florisil Cartridge Check:

Florisil Cleanup data were not submitted in this SDG. No action was taken.

Gel Permeation Chromatography (GPC):

GPC was not required in this SDG. No action was taken.

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:

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:

Blank Type/ID#	Analyte	Max. Conc.	Action Level
GDEFW027A2	aluminum	10.4 ug/L	52.0 ug/L
ICB	antimony	3.10 ug/L	15.5 ug/L
GDEFW027A2	barium	0.32 ug/L	1.60 ug/L
GDEDW027A2	cadmium	1.30 ug/L	6.50 ug/L
GDEEW027A2	chromium	1.10 ug/L	5.50 ug/L
PBW	lead	4.27 ug/L	21.4 ug/L
GDEFW027A2	nickel	0.74 ug/L	3.70 ug/L
GDEEW027A2	silver	1.00 ug/L	5.00 ug/L
GDEEW027A2	sodium	88.0 ug/L	440 ug/L
GDEEW027A2	zinc	9.00 ug/L	45.0 ug/L

PBW = Preparation Blank (Water), GDEDW027A2 = Deionized Water Blank, GDEEW027A2 = Equipment Rinsate Blank, GDEFW027A2 = Field Blank

The three field blanks were analyzed in SDG 28710A. 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, rinsate or field 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.
CCB2	barium	-0.30 ug/L	1.50 ug/L
CCB4	beryllium	-0.20 ug/L	1.00 ug/L
PBW	copper	-1.49 ug/L	7.45 ug/L
CCB2	silver	-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 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:

antimony	10 ug/L
chromium	2 ug/L
cobalt	1 ug/L
copper	2 ug/L
lead	3 ug/L
selenium	7 ug/L
silver	7 ug/L
thallium	7 ug/L

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

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

arsenic	-4 ug/L
barium	-1 ug/L
potassium	-200 ug/L

Since neither aluminum, calcium, iron nor magnesium was present in the samples at a concentration

comparable to or greater than the amount in Solution A, no action was required.

V.) ICP Serial Dilution Analysis:

All Serial Dilution Analysis criteria were met. No action was required.

VI.) Laboratory Control Samples (LCS):

All LCS Recover 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 Recoveries:

All Matrix Spike Recovery criteria were met. No action was necessary.

IX.) Field Duplicates:

Field duplicate samples GDEGW029A2 and GDEHW029A2 (analyzed in SDG 28710A) were analyzed by the laboratory. The calculable Relative Percent Differences (RPD's) were:

Analyte	GDEGW029A2, ug/L	GDEHW029A2, ug/L	RPD
aluminum	257	288	11%
calcium	29600	32400	9.0%
iron	8910	9790	9.4%
magnesium	15400	17100	11%
manganese	45.2	49.3	8.7%
potassium	10800	11300	4.5%
sodium	56300	52000	7.9%

None of the Relative Percent Differences (RPD's) exceeded 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 taken.

XI.) Sample Result, Calculation/Transcription Verification:

All criteria were met. No action was required.

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.

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 detections in the method blanks. No action was necessary.

Field Blanks:

Chlorides were not detected in the three field blanks (analyzed in SDG 28710A). No action was required.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. 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 chlorides in field duplicate samples GDEGW029A2 and GDEHW029A2 (analyzed in SDG 28710A) was 0.9%, which was less than the 30% QC limit for water samples. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.

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. No action was necessary.

Field Blanks:

Sulfates were not detected in the three field blanks (analyzed in SDG 28710A). No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. 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 sulfates in field duplicate samples GDEGW029A2 and GDEHW029A2 (analyzed in SDG 28710A) was 0%, which was less than 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.

Field Blanks:

There were no positive detections in the three field blanks (analyzed in SDG 28710A). No action was necessary.

IV.) Laboratory Check Samples (LCS):

All LCS Recovery criteria were met. 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) for TDS in field duplicate samples GDEGW029A2 and GDEHW029A2 (analyzed in SDG 28710A) was 2.9%, which was less than the 30% QC limit for water samples. No action was required.

VII.) Overall Assessment of Data/General:

All laboratory data were acceptable without qualification.