

LDC #: 3416D7
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: JA

METHOD: GC TFH Volatiles (Gasoline) ___ TFH Extractables (Diesel) ___ CDOHS LUFT EPA SW 846 Method 8015 Modified.

The continuing calibration percent difference (%D) values were recalculated for Gas / Diesel using the following calculation:

$$\text{Percent difference (\%D)} = 100 * (N - C) / N$$

Where: N = ___ Initial Calibration Factor (___) or Nominal Amount (ng)

C = ___ Calibration Factor from Continuing Calibration Standard ___ or Calculated Amount (ng)

Standard ID	Calibration Date/Time	Column	Compound	N	C	Recalculated	Reported
						%D	%D
CCH2139GAS	8-12-98/21:31	DB5-30M	Gasoline	1000.0	1047.0	4.7	4.7

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3416D7
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET Blanks

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: A

METHOD: GC TFH Volatiles (Gasoline) ___ TFH Extractables (Diesel) ___ CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were all samples associated with a method blank?
- N N/A Was a method blank analyzed for each matrix?
- N N/A Was a method blank analyzed with each batch or extraction batch?
- N N/A Was method blank contamination less than the RDL for all target compounds?

Level IV/D Only

- N N/A (Gasoline only) Was a method blank analyzed with each 24 hour batch?
- N N/A Was a method blank analyzed for each analytical/extraction batch of ≤ 20 samples?

Blank extraction date: N/A Blank analysis date: 8-12-98 Associated samples: All Samples
Conc. units: mg/L

Compound	Blank ID	Sample Identification							
	<u>VAH0839B</u>	<u>All Samples</u>							
<u>TPH by Purge & Trap</u>	<u>ND</u>	<u>—</u>							

Blank extraction date: _____ Blank analysis date: _____ Associated samples: _____
Conc. units: _____

Compound	Blank ID	Sample Identification							

Blank extraction date: _____ Blank analysis date: _____ Associated samples: _____
Conc. units: _____

Compound	Blank ID	Sample Identification							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 3416D7
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: g

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Were surrogates spiked into all samples and blanks? (Not required)

N N/A Did all surrogate recoveries (%R) meet the QC limits stated below?

#	Date	Sample ID	Surrogate Compound	%R (Limits)	Qualifications
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Bromofluorobenzene		65 - 135	
B				

LDC #: 3416D7
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
 Reviewer: Z. Pan
 2nd reviewer: ju

METHOD: GC TFH Volatiles (Gasoline); TFH Extractables (Diesel); CDOHS LUFT; EPA SW 846 Method 8015 Modified

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:
 % Recovery: SF/SS * 100
 Where: SF = Surrogate Found
 SS = Surrogate Spiked

Sample ID: #2

Surrogate	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Benzo(a)pyrene	(ppb)	(ppb)			
Bromofluorobenzene	50.0	44.0501	88	88	0
a.a.a-Trifluorotoluene					

Sample ID: _____

Surrogate	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Benzo(a)pyrene					
a.a.a-Trifluorotoluene					

Sample ID: _____

Surrogate	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Benzo(a)pyrene					
a.a.a-Trifluorotoluene					

Sample ID: _____

Surrogate	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Benzo(a)pyrene					
a.a.a-Trifluorotoluene					

Sample ID: _____

Surrogate	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Benzo(a)pyrene					
a.a.a-Trifluorotoluene					

LDC #: 3416D7
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: *[Signature]*

METHOD: GC TFH Volatiles (Gasoline) ___ TFH Extractables (Diesel) ___ CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for questions answered "N". Not applicable questions are identified as "N/A".

- Y N/A Were all samples associated with a matrix spike (MS) and matrix spike duplicate (MSD)?
Y N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix?
Y N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits stated below?

Level IV/D Only

- Y N/A Were a MS/MSD analyzed for each analytical extraction batch of ≤ 20 samples?
Y N/A Were the percent recoveries (%R) and relative percent differences (RPD) recalculated for all spiked compounds?
Y N/A Were the percent recoveries (%R) and relative percent differences (RPD) reported results within 10.0% of the recalculated results?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No MS/MSD		Client Specified				
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
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				()	()	()		

Letter Designation	Compound	Soil QC Limits		Water QC Limits	
		% Recovery	RPD	% Recovery	RPD
A	Gasoline				
B	Diesel				

LDC #: 3416D7
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: [Signature]

METHOD: GC TFH Volatiles (Gasoline) ___ TFH Extractables (Diesel) ___ CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

N N/A Were CRQLs adjusted for sample dilutions, dry weights, etc.?

N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Date	Lab ID/Reference	Finding	Associated Samples	Qualification

Comments: See sample calculation verification worksheet for recalculations

LDC #: 3416D7

SDG #: 984049

VALIDATION FINDINGS WORKSHEET

System Performance

Page: 1 of 1

Reviewer: Z. Pan

2nd Reviewer: [Signature]

METHOD: GC TFH Volatiles (Gasoline) ___ TFH Extractables (Diesel) ___ CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was the system performance acceptable?

Professional judgement was applied to assess system performance as there are no specific criteria for system performance evaluation.

#	Date	Lab ID/Reference	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416 D7
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer:

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416D7
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: Z. Pan
2nd reviewer: [Signature]

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Y (N) N/A
Y N (N/A)

Were field duplicate pairs identified in this SDG?

Were target compounds detected in the field duplicate pairs?

Compound	Concentration ()		RPD

Compound	Concentration () =		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 3416D7
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: Z Pan
2nd reviewer: [Signature]

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

N N/A Were field blanks identified in this SDG?
N N/A Were target compounds detected in the field blanks?

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: August 12, 1998
LDC Report Date: December 21, 1998
Matrix: Water
Parameters: Total Petroleum Hydrocarbons as Extractables
Validation Level: NFESC Level C & D
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 98H049

Sample Identification

18609-965
18609-966**

**Indicates sample underwent NFESC Level D review

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Samples indicated by a double asterisk on the front cover underwent a NFESC Level D review. A NFESC Level C review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level C criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

VII. System Performance

The system performance was within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

**MCAS EI Toro
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG
98H049**

No Sample Data Qualified in this SDG

**MCAS EI Toro
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification
Summary - SDG 98H049**

No Sample Data Qualified in this SDG

LDC #: 3416DB
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
 Reviewer: Z. Pan
 2nd Reviewer: g

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated for Gas Diesel using the following calculations:

CF = _____
 %RSD = $100 \cdot (S/X)$

Where: S = Standard deviation of calibration factors
 X = Mean of calibration factors

Injection volume _____ μ l or _____ ml

Calibration Date	Column	Compound	Standard	Standard concentration ()	Area	Recalculated		Reported	
						Calibration Factor (CF)	%RSD	Calibration Factor (CF)	%RSD
5-27-98	DB-5 30M	Diesel	Point 1	10	293575	29358	1.75%	29358	1.8%
			Point 2	100	2960717	29607		29607	
			Point 3	500	15187133	30374		30374	
			Point 4	1000	30612650	30613		30613	
			Point 5	2000	60343664	30172		30172	
			Mean calibration factor						
			Point 1						
			Point 2						
			Point 3						
			Point 4						
			Point 5						
			Mean calibration factor						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3416 DB
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: E. Pan
2nd Reviewer: lu

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

The continuing calibration percent difference (%D) values were recalculated for Gas / Diesel using the following calculation:

Percent difference (%D) = $100 * (N - C) / N$ Where: N = Initial Calibration Factor () or Nominal Amount (ng)
C = Calibration Factor from Continuing Calibration Standard () or Calculated Amount (ng)

Standard ID	Calibration Date/Time	Column	Compound	N (ppm)	c (ppm)	Recalculated	Reported
						%D	%D
DCC17D500	8-15-98/3:57	DB-5, 30M	Diesel	500.0	455.1	9	9

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3416 DB
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: PK

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 8-16 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were all samples associated with a method blank?
- N N/A Was a method blank analyzed for each matrix?
- N N/A Was a method blank analyzed with each batch or extraction batch?
- N N/A Was method blank contamination less than the RDL for all target compounds?

Level IV/D Only

- N (N/A) (Gasoline only) Was a method blank analyzed with each 24 hour batch?
- N N/A Was a method blank analyzed for each analytical/extraction batch of <20 samples?

Blank extraction date: 8-13-98 Blank analysis date: 8-14-98 Associated samples: All Samples.

Conc. units: mg/L

Compound	Blank ID	Sample Identification
	<u>DSH022WB</u>	<u>All Samples</u>
<u>TPH by extraction</u>	<u>ND</u>	<u>—</u>

Blank extraction date: _____ Blank analysis date: _____ Associated samples: _____
Conc. units: _____

Compound	Blank ID	Sample Identification

Blank extraction date: _____ Blank analysis date: _____ Associated samples: _____
Conc. units: _____

Compound	Blank ID	Sample Identification

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All components within five times the method blank concentration were qualified as not detected, "U".

LDC #: 3416 DB
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET Surrogate Spikes

Page: 1 of 1
 Reviewer: Z. Pan
 2nd Reviewer: [Signature]

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were surrogates spiked into all samples and blanks? (Not required)
 N N/A Did all surrogate recoveries (%R) meet the QC limits stated below?

#	Date	Sample ID	Surrogate Compound	%R (Limits)	Qualifications
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
				()	
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				()	
				()	
				()	
				()	
				()	
				()	
				()	
Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments	
A	Bromobenzene		65-135		
	Hexacosane		60-145		

LDC #: 3416 DB
SDG #: 984049

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: [Signature]

METHOD: GC ___ TFH Volatiles (Gasoline) TFH Extractables (Diesel) ___ CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Were all samples associated with a matrix spike (MS) and matrix spike duplicate (MSD)?
Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix?
Y N N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits stated below?

Level IV/D Only

- Y N N/A Were a MS/MSD analyzed for each analytical extraction batch of <20 samples?
Y N N/A Were the percent recoveries (%R) and relative percent differences (RPD) recalculated for all spiked compounds?
Y N N/A Were the percent recoveries (%R) and relative percent differences (RPD) reported results within 10.0% of the recalculated results?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No MS/MSD		Client's Specified				
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
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Letter Designation	Compound	Soil QC Limits		Water QC Limits	
		% Recovery	RPD	% Recovery	RPD
A	Gasoline				
B	Diesel				

LDC #: 34.0 DB
 SDG #: 98H049

VALIDATION FINISHINGS WORKSHEET
Laboratory Control Samples

Page: 1 of 1
 Reviewer: Z. Pan
 2nd Reviewer: [Signature]

METHOD: GC ___ TFH Volatiles (Gasoline) TFH Extractables (Diesel) ___ CDOHS LUFT ___ EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Was a LCS required?
- N N/A Was a LCS analyzed for each matrix?
- N N/A Was a LCS analyzed with each batch?
- N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits stated below?

Level IV/D Only

- N N/A Was a LCS analyzed for each analytical/extraction batch of <20 samples?
- N (N/A) (Gasoline only) Was a LCS analyzed with each 24 hour batch?

#	Date	Lab ID/Reference	Compound	%R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				()	()		
				()	()		
				()	()		
				()	()		
				()	()		
				()	()		
				()	()		
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Letter Designation	Compound	Soil QC Limits		Water QC Limits	
		% Recovery	RPD	% Recovery	RPD
A	Gasoline				
B	Diesel			61-143	< 30

LDC #: 3416 D8
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Target Compound Identification

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: g

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Level IV/D Only

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Were target compounds properly identified?

#	Date	Lab ID/Reference	Compound	Finding	Criteria	Associated Samples	Qualifications

A Gasoline Comments: _____
B Diesel _____
C _____
D _____

LDC #: 3416 D8
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: Z. Pan
2nd Reviewer: g

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

- N N/A Were CRQLs adjusted for sample dilutions, dry weights, etc.?
 N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Date	Lab ID/Reference	Finding	Associated Samples	Qualification

Comments: See sample calculation verification worksheet for recalculations

LDC #: 3416D8
SDG #: 90H049

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: 1 of 1
Reviewer: Z. Pan
2nd reviewer:

METHOD: GC TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Compound results for #2 reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(A)(V)(DF)}{(RF)(V_s)(V)(\%S)}$$

- A_i = Area of the characteristic ion (EICP) for the compound to be measured
- RF = Average response factor of the calibration standard.
- V_i = Volume or weight of sample extract in milliliters (ml) or grams (g).
- V = Volume of extract injected in microliters (ul)
- V_c = Volume of the concentrated extract in microliters (ul)
- D_f = Dilution Factor
- %S = Percent solids. applicable to soil and solid matrices only

Example

Sample I.D. _____

Conc = _____

#	Sample ID	Compound	Reported Concentration ()	Calculated Concentration ()	Acceptable (Y/N)
		The Results for #2 is ND			

Note: _____

LDC #: 3416DB
 SDG #: 984049

VALIDATION FINDINGS WORKSHEET
System Performance

Pa (1 of 1
 Reviewer: E. Pan
 2nd Reviewer:

METHOD: GC ___ TFH Volatiles (Gasoline) TFH Extractables (Diesel) ___ CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Was the system performance acceptable?

Professional judgement was applied to assess system performance as there are no specific criteria for system performance evaluation.

#	Date	Lab ID/Reference	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416DB
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
 Reviewer: Z. Pan
 2nd Reviewer: [Signature]

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416D8
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: Z. Par
2nd reviewer: [Signature]

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

Y (N) N/A Were field duplicate pairs identified in this SDG?
Y N (N/A) Were target compounds detected in the field duplicate pairs?

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 3416 DB
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: Z Pan
2nd reviewer: [Signature]

METHOD: GC TFH Volatiles (Gasoline) TFH Extractables (Diesel) CDOHS LUFT EPA SW 846 Method 8015 Modified.

N N/A Were field blanks identified in this SDG?
N N/A Were target compounds detected in the field blanks?

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: August 12, 1998
LDC Report Date: December 21, 1998
Matrix: Water
Parameters: Volatiles
Validation Level: NFESC Level C & D
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 98H049

Sample Identification

18609-965
18609-966**

**Indicates sample underwent NFESC Level D review

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260A for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a NFESC Level D review. A NFESC Level C review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level C criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

Average relative response factors (RRF) for all volatile target compounds and system monitoring compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

**MCAS EI Toro
Volatiles - Data Qualification Summary - SDG 98H049**

No Sample Data Qualified in this SDG

**MCAS EI Toro
Volatiles - Laboratory Blank Data Qualification Summary - SDG 98H049**

No Sample Data Qualified in this SDG

LDC #: 3416D1 **VALIDATION COMPLETENESS WORKSHEET**
 SDG #: 98H049 EPA Level III/IV X NFESC Level C/D
 Laboratory: EMAX Laboratories, Inc.

Date: 8/17/98
 Page: 1 of 1
 Reviewer: AK
 2nd Reviewer: SL

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>8/12/98</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	<u>RSO</u> <u>all CCC's 30 other 50%</u>
IV.	Continuing calibration	A	<u>all CCC's 25 other 45%</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	<u>client specific</u>
VIII.	Laboratory control samples	A	<u>LC5/LC50</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III/C validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III/C validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III/C validation. <u>not reported</u>
XIV.	System performance	A	Not reviewed for Level III/C validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	<u>FB =</u>

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV/D validation all 20

1	18609-965	11		21	
2	18609-966**	12		22	
3	<u>MOLKIW</u>	13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

LDC #: 341601
 SDG #: 98H049

TARGET COMPOUND WORKSHEET

Page: 1 of 1
 Reviewer: DP
 2nd Reviewer: JS

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

A. Chloromethane*	P. Bromodichloromethane	EE. Ethylbenzene**	TT. 1,2-Dibromoethane	III. n-Butylbenzene
B. Bromomethane	Q. 1,2-Dichloropropane**	FF. Styrene	UU. 1,1,1,2-Tetrachloroethane	JJJ. 1,2-Dichlorobenzene
C. Vinyl chloride**	R. cis-1,3-Dichloropropene	GG. Xylene, total	VV. Isopropylbenzene	KKK. 1,2,4-Trichlorobenzene
D. Chloroethane	S. Trichloroethene	HH. Vinyl acetate	WW. Bromobenzene	LLL. Hexachlorobutadiene
E. Methylene chloride	T. Dibromochloromethane	II. 2-Chloroethylvinyl ether	XX. 1,2,3-Trichloropropane	MMM. Naphthalene
F. Acetone	U. 1,1,2-Trichloroethane	JJ. Dichlorodifluoromethane	YY. n-Propylbenzene	NNN. 1,2,3-Trichlorobenzene
G. Carbon disulfide	V. Benzene	KK. Trichlorofluoromethane	ZZ. 2-Chlorotoluene	OOO. 1,3,5-Trichlorobenzene
H. 1,1-Dichloroethene**	W. trans-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	AAA. 1,3,5-Trimethylbenzene	PPP.
I. 1,1-Dichloroethane*	X. Bromoform*	MM. 1,2-Dibromo-3-chloropropane	BBB. 4-Chlorotoluene	QQQ.
J. 1,2-Dichloroethene	Y. 4-Methyl-2-pentanone	NN. Diethyl ether	CCC. tert-Butylbenzene	RRR.
K. Chloroform**	Z. 2-Hexanone	OO. 2,2-Dichloropropane	DDD. 1,2,4-Trimethylbenzene	SSS.
L. 1,2-Dichloroethane	AA. Tetrachloroethene	PP. Bromochloromethane	EEE. sec-Butylbenzene	TTT.
M. 2-Butanone	BB. 1,1,2,2-Tetrachloroethane*	QQ. 1,1-Dichloropropene	FFF. 1,3-Dichlorobenzene	UUU.
N. 1,1,1-Trichloroethane	CC. Toluene**	RR. Dibromomethane	GGG. p-Isopropyltoluene	VVV.
O. Carbon tetrachloride	DD. Chlorobenzene*	SS. 1,3-Dichloropropane	HHH. 1,4-Dichlorobenzene	WWW.

* = System performance check compounds (SPCC) for RF ; ** = Calibration check compounds (CCC) for %RSD.

Notes: _____

LDC #: 2601
SDG #: 98H044

VALIDATION FIN JGS WORKSHEET
GC/MS Performance Check

Page 1 of 1
Reviewer: OP
2nd Reviewer: H

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Were the BFB performance results reviewed and found to be within the EPA Functional Guideline criteria?
- Y N N/A Were all samples analyzed within the 12 hour clock criteria?

#	Laboratory ID	12 Hour Clock (Time/date)	Finding	Associated Samples	Qualifications

m/z	ION ABUNDANCE CRITERIA
50	15 - 40.0% of m/z 95
75	30.0 - 60.0% of m/z 95
95	Base peak, 100% relative abundance
96	5.0 - 9.0% of m/z 95
173	Less than 2.0% of m/z 174

m/z	ION ABUNDANCE CRITERIA
174	Greater than 50.0% of m/z 95
175	5.0 - 9.0% of mass 174
176	Greater than 95.0% but < 101% of m/z 174
177	5.0 - 9.0% of m/z 176

LDC #: 341621
 SDG #: 98HX49

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
 Reviewer: JD
 2nd Reviewer: JL

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A
- Y N N/A

Did the laboratory perform a 5 point calibration prior to sample analysis?

Were all percent relative standard deviations (%RSD) $\leq 30\%$ and relative response factors (RRF) ≥ 0.05 ? CCC $\leq 30\%$ otherwise 50%

#	Date	Standard ID	Compound	Finding %RSD (Limit: $\leq 30.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications

(

(

LDC #: 3416D1
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET

Initial Calibration Calculation Verification

Page: 1 of 1
 Reviewer: AP
 2nd Reviewer: SJ

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$$RRF = (A_x)(C_s)/(A_s)(C_x)$$

average RRF = sum of the RRFs/number of standards

$$\%RSD = 100 * (S/X)$$

A_x = Area of compound,

C_x = Concentration of compound,

S = Standard deviation of the RRFs

X = Mean of the RRFs

A_s = Area of associated internal standard

C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (50 std)	RRF (50 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	AGV504 H0086007 H0086008 H0086009	8/1/98	Methylene chloride (1st internal standard)	1.07911	1.07911	1.12657	1.12657	6.807	6.807
			Trichlorethene (2nd internal standard)	0.50967	0.50967	0.49448	0.49448	6.333	6.333
			Toluene (3rd internal standard)	1.13127	1.13127	1.08865	1.08865	6.553	6.552
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3416D
 SDG #: 98H09

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$
 $\text{RRF} = (A_x)(C_s) / (A_s)(C_x)$

Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (Initial)	Reported	Recalculated	Reported	Recalculated
					RRF (CC)	RRF (CC)	%D	%D
1	RHV205	8/13/98	Methylene chloride (1st internal standard)	1.12657	1.08127	1.08127	4.02	4.02
			Trichlorethene (2nd internal standard)	0.49448	0.51487	0.51487	4.12	4.12
			Toluene (3rd internal standard)	1.08865	1.09754	1.09754	0.82	0.82
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 341601
SDG #: 984049

VALIDATION FINDINGS WORKSHEET

Blanks

Page: 1 of 1
Reviewer: SP
2nd Reviewer: SC

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank associated with every sample in this SDG?

Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?

Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 8/13/98

Conc. units: ug/L

Associated Samples: all

Compound	Blank ID	Sample Identification							
	<u>402K10</u>								
Methylene chloride									
Acetone									
CRQL									
TICs:									
Hexamethyl-cyclotrisiloxane									
Octamethyl-cyclotetrasiloxane									

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and s that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration also qualified as not detected, "U".

LDC #: 3601
 SDG #: 9814049

VALIDATION FINISHERS WORKSHEET
Surrogate Spikes

P. (of)
 Reviewer: [signature]
 2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Were all surrogate %R within QC limits listed below?
- Y N N/A If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R out of outside of criteria?

#	Date	Lab ID/Reference	Surrogate	%Recovery (Limits)	Associated Samples	Qualifications
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- | | | | | |
|------------------------------------|-------------------------|--------------------------|-------------------------|--------------------------|
| | CLP | CLP | SW 846 Method 8260A | SW 846 Method 8260A |
| SMC1 (TOL) = Toluene-d8 | <u>QC Limits (Soil)</u> | <u>QC Limits (Water)</u> | <u>QC Limits (Soil)</u> | <u>QC Limits (Water)</u> |
| SMC2 (BFB) = Bromofluorobenzene | 84-138 | 88-110 | 81-117 | 88-110 |
| SMC3 (DCE) = 1,2-Dichloroethane-d4 | 59-113 | 86-115 | 74-121 | 86-115 |
| SMC4 (DFM) = Dibromofluoromethane | 70-121 | 76-114 | 80-120 | 80-120 |
| | - | - | 80-120 | 86-118 |

LDC #: 3416D1
 SDG #: 9811049

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS * 100$

Where: SF = Surrogate Found
 SS = Surrogate Spiked

Sample ID: 2

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	50	47.45	95	95	0
Bromofluorobenzene	↓	48.72	97	97	0
1,2-Dichloroethane-d4	↓	44.36	89	89	0
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 31 ADI
 SDG #: 98H049

VALIDATION FINISHING WORKSHEET
Matrix Spike/Matrix Spike Duplicates

P: 1 of 1
 Reviewer: OP
 2nd Reviewer: SL

METHOD : GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y (N) N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.
- Y (N) N/A Was a MS/MSD analyzed every 20 samples of each matrix?
- Y N (N/A) Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		<i>element specific</i>		()	()	()		
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	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	1,1-Dichloroethene	59-172%	≤ 22%	61-145%	≤ 14%
B.	Trichloroethene	62-137%	≤ 24%	71-120%	≤ 14%
C.	Benzene	66-142%	≤ 21%	76-127%	≤ 11%
D.	Toluene	59-139%	≤ 21%	76-125%	≤ 13%
E.	Chlorobenzene	60-133%	≤ 21%	75-130%	≤ 13%

LDC #: 3416D1
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
 Reviewer: DP
 2nd Reviewer: SS

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = $100 * (SSC - SC) / SA$

Where: SSC = Spiked sample concentration
 SA = Spike added

SC = Sample concentration

RPD = $100 * |MSC - MSDC| / (MSC + MSDC)$

MSC = Matrix spike percent recovery

MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: NA

Compound	Spike Added ()		Sample Concentration ()	Spiked Sample Concentration ()		Matrix Spike		Matrix Spike Duplicate		MS/MSD	
	MS	MSD	-----	MS	MSD	Percent Recovery		Percent Recovery		RPD	
						Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene											
Trichloroethene											
Benzene											
Toluene											
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31 001
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
 Laboratory Control Samples (LCS)

Page 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Was a LCS required?
- Y N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

lab limits

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				()	()	()		
				()	()	()		
				()	()	()		
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	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	1,1-Dichloroethane				
B.	Trichloroethene				
C.	Benzene				
D.	Toluene				
E.	Chlorobenzene				

LDC #: 3416D1
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8240)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration
 SA = Spike added

RPD = |LCS - LCSD| * 2 / (LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: LCS1W/LCSD1W

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD	
					Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	20	20	22.8	22.2	114	114	111	111	3	3
Benzene	↓	↓	19.6	19.5	98	98	98	98	0	0
Chlorobenzene	↓	↓	21.1	20.4	106	106	102	102	3	4
Toluene	↓	↓	21.2	20	106	106	100	100	6	6
Trichloroethene	↓	↓	20	20	100	100	100	100	0	0

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34 201
SDG #: 98 # 049

VALIDATION FINISHINGS WORKSHEET Internal Standards

Page 1 of 1
Reviewer: DP
2nd Reviewer: RP

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were all internal standard area counts within -50 to +100% of the associated calibration standard?
- N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Lab ID/Reference	Internal Standard	Area (Limits)	RT (Limits)	Qualifications

IS_ (BCM) = Bromochloromethane IS_ (PFB) = Pentafluorobenzene
 IS_ (DFB) = 1,4-Difluorobenzene IS_ (DCB) = 1,4-Dichlorobenzene-d4
 IS_ (CBZ) = Chlorobenzene-d5

LDC #: 3416D1
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Page: 1 of 1
Reviewer: AP
2nd Reviewer: H

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?
- N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: See sample calculation verification worksheet for recalculations



LDC #: 3 (2D)
SDG #: 98 H049

VALIDATION FINAL GS WORKSHEET
Target Compound Identification

Page 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?
- N N/A Did compound spectra meet specified EPA "Functional Guidelines" criteria?
- N N/A Were chromatogram peaks verified and accounted for?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 341601
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
 Reviewer: RP
 2nd reviewer: LL

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Compound results for 2 reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(A_x)(I_s)(DF)}{(A_s)(RRF)(V_o)(\%S)}$$

- A_x = Area of the characteristic ion (EICP) for the compound to be measured
- A_s = Area of the characteristic ion (EICP) for the specific internal standard
- I_s = Amount of internal standard added in nanograms (ng)
- RRF = Relative response factor of the calibration standard.
- V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).
- Df = Dilution factor.
- %S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 2 P:

$$\text{Conc.} = \frac{(42710)(250\text{ng})(1.0)}{(504315)(0.62987)(5\text{ml})(\text{NA})}$$

$$= 6.72 \text{ } \mu\text{g/L}$$

#	Sample ID	Compound	Reported Concentration ($\mu\text{g/L}$)	Calculated Concentration ($\mu\text{g/L}$)	Acceptable (Y/N)
1	2	P	6.72	6.72	Y
		K	7.78	7.78	↓
		T	4.31	4.31	
		E	2.36	2.36	

Note: MeCL₂ = Methylene chloride

LDC #: 341021
SDG #: 9.1049

VALIDATION FINDINGS WORKSHEET
Tentatively Identified Compounds

Page (1 of)
Reviewer: DP
2nd Reviewer: JS

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?

Y N N/A Were relative intensities of the major ions within $\pm 20\%$ between the sample and the reference spectra?

Y N N/A Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		<i>NOT REPORTED</i>			

Comments: _____

LDC #: 341601
 SDG #: 984049

VALIDATION FINDINGS WORKSHEET
System Performance

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Was the system performance acceptable?

Professional judgement was applied to assess system performance as there are no specific criteria for system performance evaluation.

#	Date	Lab ID/Reference	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 34 DI
SDG #: 984049

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page (1 of 1)
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416D1
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: OP
2nd reviewer: SI

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Y N/A
Y N N/A

Were field duplicate pairs identified in this SDG?

Were target compounds detected in the field duplicate pairs?

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 3416D1
SDG #: 48H049

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: DF
2nd reviewer: R

METHOD: GC/MS VOA (EPA SW 846 Method 8240/8260)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units ()

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: August 12, 1998
LDC Report Date: December 21, 1998
Matrix: Water
Parameters: Semivolatiles
Validation Level: NFESC Level C & D
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 98H049

Sample Identification

18609-965
18609-966**

**Indicates sample underwent NFESC Level D review

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270B for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Samples indicated by a double asterisk on the front cover underwent a NFESC Level D review. A NFESC Level C review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level C criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

Average relative response factors (RRF) for all semivolatile target compounds and system monitoring compounds were greater than or equal to 0.05 as required.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 20.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

All of the continuing calibration RRF values were greater than or equal to 0.05 .

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XV. Overall Assessment

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

MCAS EI Toro
Semivolatiles - Data Qualification Summary - SDG 98H049

No Sample Data Qualified in this SDG

MCAS EI Toro
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 98H049

No Sample Data Qualified in this SDG

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>8/12/98</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	<u>RJO</u> <u>all CCC ≤ 30 other ≤ 50%</u>
IV.	Continuing calibration	A	<u>all CCC ≤ 20 other ≤ 50</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	<u>Client specific</u>
VIII.	Laboratory control samples	A	<u>LCS/LCSO</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III/C validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III/C validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for Level III/C validation. <u>must reported</u>
XIV.	System performance	A	Not reviewed for Level III/C validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV/D validation all 20

1	18609-965	11		21	
2	18609-966**	12		22	
3	<u>MBLKIW</u>	13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

LDC #: 341602
SDG #: 981049

VALIDATION FINDINGS WORKSHEET Technical Holding Times

Page: 1 of 1
Reviewer: OP
2nd Reviewer: II

All circled dates have exceeded the technical holding times.
 N N/A Were all cooler temperatures within validation criteria? _____

METHOD : GC/MS BNA (EPA SW 846 Method 8270)							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2	H2O	NA	8/12/98	8/12/98	8/16/98	—	None

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 31612
SDG #: 981049

VALIDATION FINDINGS WORKSHEET
GC/MS Performance Check

Page: 1 of 1
Reviewer: AP
2nd Reviewer: SR

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were the DFTPP performance results reviewed and found to be within the EPA Functional Guideline criteria?
 N N/A Were all samples analyzed within the 12 hour clock criteria?

#	Laboratory ID	12 Hour Clock (Time/date)	Finding	Associated Samples Client ID	Qualifications

m/z	ION ABUNDANCE CRITERIA	m/z	ION ABUNDANCE CRITERIA
51	30.0 - 60.0% of m/z 198	199	5.0 - 9.0% of m/z 198
68	Less than 2.0% of m/z 69	275	10.0 - 30.0% of m/z 198
69	Present	365	Greater than 1.0% of m/z 198
70	Less than 2.0% of 69	441	Present, but less than m/z 443
127	40.0 - 60.0% of m/z 198	442	Greater than 40.0% of m/z 198
197	Less than 1.0% of m/z 198	443	17.0 - 23.0% of m/z 442
198	Base peak, 100% relative abundance		

LDC #: 31-02
 SDG #: 981049

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
 Revised by: OP
 2nd Reviewer: CI

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_s)/(A_s)(C_x)$
 average RRF = sum of the RRFs/number of standards
 $\%RSD = 100 * (S/X)$

A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard
 S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (40 std)	RRF (40 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	AS094 6 3 2 7 8		Phenol (1st internal standard)	1.58019	1.58019	1.54136	1.54136	4.708	4.708
			Naphthalene (2nd internal standard)	1.00506	1.00506	0.91172	0.91172	15.315	15.315
			Fluorene (3rd internal standard)	1.08145	1.08145	0.97050	0.97050	23.1616	23.1616
			Pentachlorophenol (4th internal standard)	0.13397	0.13397	0.14706	0.14706	22.341	22.341
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.98452	0.98452	0.86656	0.86656	10.829	10.829
			Benzo(a)pyrene (6th internal standard)	1.00290	1.00290	0.97630	0.97631	2.718	2.718
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34 D2
 SDG #: 48HJ19

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Were percent recoveries (%R) for surrogates within QC limits stated below?
- Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
- Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
				()	
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* QC limits are advisory

<u>QC Limits (Soil)</u>	<u>QC Limits (Water)</u>	<u>QC Limits (Soil)</u>	<u>QC Limits (Water)</u>
S1 (NBZ) = Nitrobenzene-d5 23-120	35-114	S5 (2FP) = 2-Fluorophenol 25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl 30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol 19-122	10-123
S3 (TPH) = Terphenyl-d14 18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4 20-130*	33-110*
S4 (PHL) = Phenol-d5 24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4 20-130*	16-110*

LDC #: 3416D2
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
 Reviewer: DP
 2nd reviewer: SK

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
 SS = Surrogate Spiked

Sample ID: 2

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Nitrobenzene-d5	100 ↓	75.97	76	76	0
2-Fluorobiphenyl		82.77	83	83	0
Terphenyl-d14		80.76	81	81	0
Phenol-d5	150 ↓	105.94	71	71	0
2-Fluorophenol		97.22	65	65	0
2,4,6-Tribromophenol		91.33	61	61	0
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 3102
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page 1 of 1
 Reviewer: OP
 2nd Reviewer: SI

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			<u>Chemt specific</u>	()	()	()		
				()	()	()		
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	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	G.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
B.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	H.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
C.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	I.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
D.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	J.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
E.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	K.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
F.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 3416D2
 SDG #: 9840A

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
 Reviewer: DP
 2nd Reviewer: JT

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = $100 * (SSC - SC) / SA$

Where: SSC = Spiked sample concentration
 SA = Spike added

SC = Sample concentration

RPD = $100 * |MS - MSD| / (MS + MSD)$

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: NA

Compound	Spike Added ()		Sample Concentration ()	Spiked Sample Concentration ()		Matrix Spike		Matrix Spike Duplicate		MS/MSD	
	MS	MSD		MS	MSD	Percent Recovery		Percent Recovery		RPD	
						Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol											
2-Chlorophenol											
1,4-Dichlorobenzene											
N-Nitroso-di-n-propylamine											
1,2,4-Trichlorobenzene											
4-Chloro-3-methylphenol											
Acenaphthene											
4-Nitrophenol											
2,4-Dinitrotoluene											
Pentachlorophenol											
Pyrene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 341602
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration
 SA = Spike added

SC = Sample concentration

RPD = |LCS - LCSD| * 2 / (LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: LCS1W/LCSD1W

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD		LCS	LCSD	Percent Recovery		Percent Recovery		RPD	
						Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol	150	150	ND	108	163	72	72	69	69	5	4
2-Chlorophenol	↓	↓		110	164	73	73	69	69	6	6
1,4-Dichlorobenzene	100	100		70	65.2	70	70	65	65	7	7
N-Nitroso-di-n-propylamine	↓	↓		87.8	80.7	88	88	81	81	8	8
1,2,4-Trichlorobenzene	↓	↓		73.9	68.2	74	67.4	68	68	8	8
4-Chloro-3-methylphenol	150	150		105	109	70	70	72	73	4	3
Acenaphthene	100	100		79.9	75.7	80	80	76	76	5	5
4-Nitrophenol	150	150		135	124	90	90	83	83	9	8
2,4-Dinitrotoluene	100	100		94.3	86.7	94	94	87	87	8	8
Pentachlorophenol	150	150		153	139	102	102	93	93	9	9
Pyrene	100	100	↓	80.7	76.8	81	81	77	77	5	5

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31122
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Lab ID/Reference	Internal Standard	Area (Limits)	RT (Limits)	Qualifications

* QC limits are advisory
IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10
IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

LDC #: 3416DZ

SDG #: 9840A

VALIDATION FINDINGS WORKSHEET
Target Compound Identification

Page: 1 of 1
 Reviewer: R
 2nd Reviewer: W

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N (N/A) Relative retention times (RRT's) were within ± 0.06 RRT units of the standard?
 Y N (N/A) Compound spectra meets EPA "Functional Guidelines" criteria?
 N (N/A) Chromatogram peaks were verified and accounted for?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		<i>no detects</i>			

Comments: _____

LDC #: 81102
SDG #: 9811049

VALIDATION FINDINGS WORKSHEET Compound Quantitation and Reported CRQLs

Page 1 of 1
Review: AC
2nd Reviewer: N

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A

Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

N N/A

Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: See sample calculation verification worksheet for recalculations

LDC #: 341602
 SDG #: 994049

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Compound results for 2 reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(A_s)(I_s)(V_i)(DF)(GPC)}{(A_w)(RRF)(V_e)(V_c)(\%S)}$$

- A_s = Area of the characteristic ion (EICP) for the compound to be measured
- A_w = Area of the characteristic ion (EICP) for the specific internal standard
- I_s = Amount of internal standard added in nanograms (ng)
- V_e = Volume or weight of sample extract in milliliters (ml) or grams (g).
- V_i = Volume of extract injected in microliters (ul)
- V_c = Volume of the concentrated extract in microliters (ul)
- Df = Dilution Factor.
- %S = Percent solids, applicable to soil and solid matrices only.
- GPC = 2.0 factor to account for GPC cleanup where applicable

Example:

Sample I.D. _____ , _____:

$$\text{Conc.} = \frac{(\quad)(\quad)(\quad)(\quad)(\quad)}{(\quad)(\quad)(\quad)(\quad)(\quad)}$$

=

#	Sample ID	Compound	Reported Concentration ()	Calculated Concentration ()	Acceptable (Y/N)
		<i>no detects</i>			

Note: Bis(2-ethylhexyl)phthalate = BEHP, Di-n-Butylphthalate = DNBP, Di-n-octylphthalate = DNOP, Butylbenzylphthalate = BBP

LDC #: 3416D2
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET

Tentatively Identified Compounds

Page: 1 of 1
 Reviewer: (Signature)
 2nd Reviewer: (Signature)

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?
Y N N/A Were relative intensities of the major ions within $\pm 20\%$ between the sample and the reference spectra?
Y N N/A Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		<u>not reported</u>			

Comments: _____

LDC #: 34 D2
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
System Performance

Page 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Was the system performance acceptable?

Professional judgement was applied to assess system performance as there are no specific criteria for system performance evaluation.

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416D2
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: _____

ow () ()

LDC #: 3416D2
SDG #: 98H019

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: DP
2nd reviewer: K

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y (N) N/A
Y N (N/A)

Were field duplicate pairs identified in this SDG?

Were target compounds identified in the field duplicate pairs?

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 3416D2
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: AP
2nd reviewer: SL

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N/A Were field blanks identified in this SDG?
Y N A Were target compounds identified in the field blanks?

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: August 12, 1998
LDC Report Date: December 19, 1998
Matrix: Water
Parameters: Chlorinated Pesticides & PCBs
Validation Level: NFESC Level C & D
Laboratory: EMAX Laboratories, Inc.
Sample Delivery Group (SDG): 98H049

Sample Identification

18609-965
18609-966**

**Indicates sample underwent NFESC Level D review.

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081 for Chlorinated Pesticides and PCBs.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Samples indicated by a double asterisk on the front cover underwent a NFESC Level D review. A NFESC Level C review was performed on all other samples. Raw data were not evaluated for the samples reviewed by Level C criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Retention time windows were evaluated and considered technically acceptable for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples on which a Level C review was performed.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples on which a Level C review was performed.

The individual 4,4'-DDT and Endrin breakdowns were less than or equal to 20.0% .

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide or PCB contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
18609-965	RTX CLP PESTII	Tetrachloro-m-xylene	33 (45-125)	All TCL compounds	J	A
18609-966**	RTX CLP PESTII	Tetrachloro-m-xylene	36 (45-125)	All TCL compounds	J	A

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
MBIk1W LCS/LCSD	gamma-BHC	63 (73-125)	All samples in SDG 98H049	J	A

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on

which an NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample 18609-965 was identified as a source blank. No chlorinated pesticide or PCB contaminants were found in this blank.

**MCAS El Toro
Chlorinated Pesticides & PCBs - Data Qualification Summary - SDG 98H049**

SDG	Sample	Compound	Flag	A or P	Reason
98H049	18609-965 18609-966**	All TCL compounds	J	A	Surrogate spikes (%R)
98H049	18609-965 18609-966**	gamma-BHC	J	A	Laboratory control samples (%R)

**MCAS El Toro
Chlorinated Pesticides & PCBs - Laboratory Blank Data Qualification Summary -
SDG 98H049**

No Sample Data Qualified in this SDG

METHOD: GC Organochlorine Pesticides/PCBs (EPA SW 846 Method 8081)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8-12-98
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	✓RSD
IV.	Continuing calibration	A	✓D
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	N	Client specified
VIII.	Laboratory control samples	SW	LCS/LCSD
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	Not reviewed for Level III/C validation.
XII.	Compound quantitation and reported CRQLs	A	Not reviewed for Level III/C validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	ND	SB=1

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV/D validation

1	SB 18609-965	AQ	11		21	
2	18609-966**	↓	12		22	
3	MBIK 1W	↓	13		23	
4			14		24	
5			15		25	
6			16		26	
7			17		27	
8			18		28	
9			19		29	
10			20		30	

LDC #: 346 03
 SDG #: 9814049

VALIDATION FINDINGS WORKSHEET
 GC/ECD Instrument Performance Check

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Professional judgement was applied to assess system performance as there are no specific criteria for system performance evaluation.

N/A Was the system performance found to be acceptable?

#	Date	Standard ID	Column	Compound	RT Limits	Associated Samples	Qualifications
					()		
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					()		

Comments: _____

LDC #: 341603
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET

Initial Calibration

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Was a 5 point calibration curve performed?
- Y N N/A Was a linear fit used for evaluation? If yes, the acceptance criteria used for each compound is %RSD less than or equal to 20.0%.
- Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? _____
- Y N N/A Did the initial calibration meet the acceptance criteria?
- Y N N/A Was initial calibration performed at the required frequency?

Level IV/D Only

- Y N N/A Were the retention time window sizes properly established for all compounds?
- Y N N/A Were compounds run at the required concentrations in the initial calibration?
- Y N N/A Were the linearity or curve results recalculated? (Please see the Initial Calibration calculation verification worksheet.)
- Y N N/A Were the linearity or curve reported results within 10.0% of the recalculated results?

#	Date	Standard ID	Column	Compound	Finding	Associated Samples	Qualifications

- | | | | | | | | | |
|--------------|-----------------------|------------------|-----------------------|--------------------|-----------------|------------------|-------------|-----------|
| A. alpha-BHC | E. Heptachlor | I. Dieldrin | M. 4,4'-DDD | Q. Endrin ketone | U. Toxaphene | Y. Aroclor-1242 | CC. DB 608 | GG. _____ |
| B. beta-BHC | F. Aldrin | J. 4,4'-DDE | N. Endosulfan sulfate | R. Endrin aldehyde | V. Aroclor-1016 | Z. Aroclor-1248 | DD. DB 1701 | HH. _____ |
| C. delta-BHC | G. Heptachlor epoxide | K. Endrin | O. 4,4'-DDT | S. alpha-Chlordane | W. Aroclor-1221 | AA. Aroclor-1254 | EE. _____ | II. _____ |
| D. gamma-BHC | H. Endosulfan I | L. Endosulfan II | P. Methoxychlor | T. gamma-Chlordane | X. Aroclor-1232 | BB. Aroclor-1260 | FF. _____ | JJ. _____ |

LDC #: 3A.03
SDG #: 9P11049

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: 1 of 2
Reviewer: AM
2nd Reviewer: g

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated for Endosulfan I & Methoxychlor using the following calculations:

$$CF = \frac{\text{Peak Area}}{\text{Std. Conc.}}$$

$$\%RSD = 100 * (S/X)$$

Where: S = Standard deviation of calibration factors
X = Mean of calibration factors

Injection volume = 1 ul

Calibration Date	Column	Compound	Standard	Standard concentration (ppb)	Area	Recalculated		Reported	
						Calibration Factor (CF)	%RSD	Calibration Factor (CF)	%RSD
8-13-98	RTA-CLIPPER	Endosulfan I	Point 1	5	157367	31973.9	15.9	31973.9	15.9
			Point 2	10	289942	28999.2		28999.2	
			Point 3	20	542305	27115.3		27115.3	
			Point 4	40	926020	23150.5		23150.5	
			Point 5	60	1272068	21201.1		21201.1	
			Mean calibration factor						
	GC TOUP	Methoxychlor	Point 1	50	492841	9856.3	19.7	9856.8	19.7
			Point 2	100	865122	8651.2		8651.2	
			Point 3	200	1563662	7818.3		7818.3	
			Point 4	400	2660292	6650.7		6650.7	
			Point 5	600	3606570	6011		6011	
			Mean calibration factor						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 391603
 SDG #: 9P1F049

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 2 of 2
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

The calibration factors (CF) and relative standard deviation (%RSD) were recalculated for Endosulfan I & Methoxychlor using the following calculations:

$CF = \frac{\text{Peak Area}}{\text{Std. Conc.}}$
 $\%RSD = 100 * (S/X)$

Where: S = Standard deviation of calibration factors
 X = Mean of calibration factors

Injection volume = 1 ul

Calibration Date	Column	Compound	Standard	Standard concentration (ppb)	Area	Recalculated		Reported	
						Calibration Factor (CF)	%RSD	Calibration Factor (CF)	%RSD
8-13-98	RTX-CLIPPER II	Endosulfan I	Point 1	5	51891	10368.2	9.6	10368.2	9.6
			Point 2	10	101073	10107.3		10107.3	
			Point 3	20	209301	10215		10215	
			Point 4	90	370705	9267.6		9267.6	
			Point 5	60	576848	9618.1		9618.1	
			Mean calibration factor					9914.5	
	GC TOUP	Methoxychlor	Point 1	50	183767	3675.3	5.5	3675.3	5.5
			Point 2	100	355616	3556.2		3556.2	
			Point 3	200	712073	3560.4		3560.4	
			Point 4	900	1361437	3803.6		3803.6	
			Point 5	600	1910451	3188.1		3188.1	
			Mean calibration factor					3875.9	

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3416 D3
SDG #: 9P1 79

VALIDATION FINDINGS WORKSHEET
Continuing calibration

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

- Y N N/A What type or calibration verification calculation was performed? %D or RPD
- Y N N/A Were Evaluation mix standards run before initial calibration and before samples?
- Y N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard ($\leq 20.0\%$ for individual breakdowns)?
- Y N N/A Was at least one Individual Mix standards A and/or B run daily to verify the working curve?
- Y N N/A Were continuing standards analyzed at a frequency of every 10 samples to verify the working curve?
- Y N N/A Did the continuing calibration standards meet the percent difference (%D) relative percent difference (RPD) criteria of $\leq 15.0\%$?

Level IV/D Only

- Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?
- Y N N/A Were the percent difference (%D) results recalculated? (Please see Calibration verification results verification worksheet.)
- Y N N/A Were the (%D) recalculated results within 10.0% of the reported results?

#	Date	Standard ID	Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
						()		
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- | | | | | | | | | |
|--------------|-----------------------|------------------|-----------------------|--------------------|-----------------|------------------|-------------|-----------|
| A. alpha-BHC | E. Heptachlor | I. Dieldrin | M. 4,4'-DDD | Q. Endrin ketone | U. Toxaphene | Y. Aroclor-1242 | CC. DB 608 | GG. _____ |
| B. beta-BHC | F. Aldrin | J. 4,4'-DDE | N. Endosulfan sulfate | R. Endrin aldehyde | V. Aroclor-1016 | Z. Aroclor-1248 | DD. DB 1701 | HH. _____ |
| C. delta-BHC | G. Heptachlor epoxide | K. Endrin | O. 4,4'-DDT | S. alpha-Chlordane | W. Aroclor-1221 | AA. Aroclor-1254 | EE. _____ | II. _____ |
| D. gamma BHC | H. Endosulfan I | L. Endosulfan II | P. Methoxychlor | T. gamma-Chlordane | X. Aroclor-1232 | BB. Aroclor-1260 | FF. _____ | JJ. _____ |

LDC #: 341603
 SDG #: 98H044

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
 Reviewer: *[Signature]*
 2nd Reviewer: *[Signature]*

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

The calibration verification percent difference (%D) values were recalculated for Endosulfan I and Methoxychlor using the following calculation:

Percent difference (%D) = $100 * (N - C) / N$ Where: N = ___ Initial Calibration Factor or Nominal Amount (ng)
 C = ___ Calibration Factor from Continuing Calibration Standard or Calculated Amount (ng)

Standard ID	Calibration Date/Time	Column	Compound	N	C	Recalculated	Reported
						%D	%D
DCC01	8-15-98/1147	RTX-CUPPEST	Endosulfan I	20	20.4	2.0	2.1
		RTX-CUPPEST	↓	↓	19.3	3.5	3.3
		RTX-CUPPEST	Methoxychlor	200	217.3	8.7	8.6
		RTX-CUPPEST	↓	↓	216.9	8.5	8.9

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 5.16 D3
 SDG #: 98H099

VALIDATION FINDINGS WORKSHEET
Blanks

Page 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Were all samples associated with a method blank?
- Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
- Y N N/A If extract clean-up was performed, were extract clean-up blanks analyzed at the proper frequencies?
- Y N N/A Were any pesticide/PCB contaminants detected above the reporting limit in the method blanks?
- Y N N/A Was method blank contamination < CRQL for all target compounds?

Blank extraction date: 8-14-98 Blank analysis date: 8-15-98 Associated samples: 1-2
 Conc. units: ug/L

Compound	Blank ID	Sample Identification							
	<u>MBIK1W</u>	<u>1-2</u>							
<u>All Target Compounds</u>	<u>ND</u>	<u>-</u>							

Blank extraction date: _____ Blank analysis date: _____ Associated samples: _____
 Conc. units: _____

Compound	Blank ID	Sample Identification							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
 All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 3816D3
 SDG #: 98H099

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: _____
 Reviewer: _____
 2nd Reviewer: _____

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples, standards and blanks?
 Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits stated below?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
1	8-15-98	1	RTX CUPPER	B	33 (85-125)	J/A
	↓		↓	↓	()	↓
2		2			36 ()	
					()	
					()	
					()	
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					()	
					()	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	DCB		38-133	
B	TCX		45-125	

LDC #: 3416D3
 SDG #: 9P14849

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS * 100$

Where: SF = Surrogate Found
 SS = Surrogate Spiked

Sample ID: 2

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
		<u>ppb</u>	<u>ppb</u>			
Tetrachloro-m-xylene	<u>Ch. A</u>	<u>20.0</u>	<u>10.5</u>	<u>53</u>	<u>53</u>	<u>0</u>
Tetrachloro-m-xylene	<u>Ch. B</u>		<u>7.1</u>	<u>36</u>	<u>36</u>	
Decachlorobiphenyl	<u>Ch. A</u>		<u>25.4</u>	<u>127</u>	<u>127</u>	
Decachlorobiphenyl	<u>Ch. B</u>		<u>29.9</u>	<u>125</u>	<u>125</u>	

Sample ID: _____

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
achlorobiphenyl						

Sample ID: _____

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID: _____

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Notes: _____

LDC #: 3916D3
SDG #: 9P14049

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y (N) N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
- Y (N) N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
- Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits stated below?
- Level IV/D Only**
- Y (N) N/A Were the percent recoveries (%R) and the relative percent differences (RPD) recalculated?
- Y (N) N/A Were the %R and RPD reported results within 10.0% of the recalculated results?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		

Letter Designation	Compound	Soil QC Limits		Water QC Limits	
		% Recovery	RPD	% Recovery	RPD
A	gamma-BHC				
B	Heptachlor				
C	Aldrin				
D	Dieldrin				
E	Endrin				
F	4,4'-DDT				
G					
H					
I					
J					

LDC #: 74103
 SDG #: 981-49

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

The percent recoveries (%R) and Relative Percent difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC-SC)/SA

Where: SSC = Spiked sample concentration
 SA = Spike added

SC = Concentration

RPD = |MS - MSD| * 2 / (MS + MSD)

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: _____

MS/MSD not performed

Compound	Spike Added		Sample Concentration	Spiked Sample Concentration		Matrix Spike		Matrix Spike Duplicate		MS/MSD	
	()			()		Percent Recovery		Percent Recovery		RPD	
	MS	MSD	-	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC											
Heptachlor											
Aldrin											
Dieldrin											
Endrin											
4,4'-DDT											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3416 P3
 SDG #: 984049

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? _____
 N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits stated below?

Level IV/D Only

N N/A Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	EXT. Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
1	8-14-98	MBIK1W LCS/LCSD	A	63 (73-125)	()	()	All AQ Samples (13/18)	J/A
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
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				()	()	()		

Letter Designation	Compound	Soil QC Limits		Water QC Limits	
		% Recovery	RPD	% Recovery	RPD
A	gamma-BHC			73-125	≤ 30
B	Heptachlor			45-120	↓
C	Aldrin			47-125	
D	Dieldrin			42-132	
E	Endrin			43-134	
F	4,4'-DDT			34-193	
G					
H					
I					
J					



LDC #: 38873
SDG #: 981049

VALIDATION FINDINGS WORKSHEET
Pesticide Clean-up Check (Florisil Cartridge Check)

Page: 1 of 1
Review: [Signature]
2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Was a florisil cartridge clean-up performed on all samples, blanks, and MS/MSD? (Not required)
- Y N N/A Was a florisil cartridge check performed when a clean-up was performed?
- Y N N/A Were all compound percent recoveries (%R) within 80-120%?

LEVEL IV/D ONLY

- Y N N/A Were the %R results recalculated? (Please see Florisil cartridge check calculation verification worksheet.)
- Y N N/A Were the %R reported results within 10.0% of the recalculated results?

#	Date	Florisil Lot #	Compound	%R (Limits: 80-120%)	Associated Samples	Qualifications

- A. alpha-BHC E. Heptachlor I. Dieldrin M. 4,4'-DDD Q. Endrin ketone U. Toxaphene Y. Aroclor-1242
- B. beta-BHC F. Aldrin J. 4,4'-DDE N. Endosulfan sulfate R. Endrin aldehyde V. Aroclor-1016 Z. Aroclor-1248
- C. delta-BHC G. Heptachlor epoxide K. Endrin O. 4,4'-DDT S. alpha-Chlordane W. Aroclor-1221 AA. Aroclor-1254
- D. gamma-BHC H. Endosulfan I L. Endosulfan II P. Methoxychlor T. gamma-Chlordane X. Aroclor-1232 BB. Aroclor-1260

LDC #: 341603
SDG #: 9811049

VALIDATION FINDINGS WORKSHEET Florisil Cartridge Check Calculation Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

The florisil cartridge check percent recovery (%R) values were recalculated for _____ using the following calculation:

Percent recovery (%R) = $100 * SR/SA$

Where: SR = Spike recovered (ng)
SA = Spike added (ng)

Not Required Not Performed

Lot Number	Analysis Date	Columns	Compound	SR (ng)	SA (ng)	Recalculated	Reported
						%R	%R

Comments: Refer to Pesticide Clean-up Check (Florisil Cartridge Check) findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 34'D3
SDG #: 98.1049

VALIDATION FINDINGS WORKSHEET
Pesticide Clean-up Check (GPC Calibration)

Page: 1 of 1
Reviewer: *[Signature]*
2nd Reviewer: *[Signature]*

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a GPC clean-up performed on all soil samples, blanks, and MS/MSD's? (Not required)

Y N N/A Was a GPC calibration performed when a clean-up was performed?

Y N N/A Were all compound percent recoveries (%R) within 80-110%?

LEVEL IV/D ONLY

Y N N/A Were the %R results recalculated? (Please see GPC calibration calculation verification worksheet.)

Y N N/A Were the %R reported results within 10.0% of the recalculated results?

#	Date	GPC Column	Compound	%R (Limits: 80-110%)	Associated Samples	Qualifications

- A. alpha-BHC
- B. beta-BHC
- C. delta-BHC
- D. gamma-BHC
- E. Heptachlor
- F. Aldrin
- G. Heptachlor epoxide
- H. Endosulfan I
- I. Dieldrin
- J. 4,4'-DDE
- K. Endrin
- L. Endosulfan II
- M. 4,4'-DDD
- N. Endosulfan sulfate
- O. 4,4'-DDT
- P. Methoxychlor
- Q. Endrin ketone
- R. Endrin aldehyde
- S. alpha-Chlordane
- T. gamma-Chlordane
- U. Toxaphene
- V. Aroclor-1016
- W. Aroclor-1221
- X. Aroclor-1232
- Y. Aroclor-1242
- Z. Aroclor-1248
- AA. Aroclor-1254
- BB. Aroclor-1260
- CC. DB 608
- DD. DB 1701

LDC #: 341603
SDG #: 9814049

VALIDATION FINDINGS WORKSHEET GPC Calibration Calculation Verification

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

The GPC calibration percent recovery (%R) values were recalculated for _____ using the following calculation:

Percent recovery (%R) = $100 * SR/SA$

Where: SR = Spike recovered (ng)
SA = Spike added (ng)

Not Required Not Performed

Calibration Date	Columns	Compound	SR (ng)	SA (ng)	Recalculated	Reported
					%R	%R

Comments: Refer to Pesticide Clean-up Check (GPC Calibration) findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 341093
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
 Target Compound Identification

Page: 1 of 1
 Review: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as N/A.

Level IV/D Only

Y N (N/A) Were the retention times for detected target compounds within their retention time windows?

#	Date	Standard ID	Column	Compound	RT Limits	Associated Samples	Qualifications
					()		
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- | | | | | | | | | |
|--------------|-----------------------|------------------|-----------------------|--------------------|-----------------|------------------|-------------|-----------|
| A. alpha-BHC | E. Heptachlor | I. Dieldrin | M. 4,4'-DDD | Q. Endrin ketone | U. Toxaphene | Y. Aroclor-1242 | CC. DB 608 | GG. _____ |
| B. beta-BHC | F. Aldrin | J. 4,4'-DDE | N. Endosulfan sulfate | R. Endrin aldehyde | V. Aroclor-1016 | Z. Aroclor-1248 | DD. DB 1701 | HH. _____ |
| C. delta-BHC | G. Heptachlor epoxide | K. Endrin | O. 4,4'-DDT | S. alpha-Chlordane | W. Aroclor-1221 | AA. Aroclor-1254 | EE. _____ | II. _____ |
| D. gamma-BHC | H. Endosulfan I | L. Endosulfan II | P. Methoxychlor | T. gamma-Chlordane | X. Aroclor-1232 | BB. Aroclor-1260 | FF. _____ | JJ. _____ |

LDC #: 3416D3
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: AS
2nd reviewer: JS

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Compound results for All Level D Sample reported with a positive detect were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(\quad)}{(\quad)}$$

Example:

Sample I.D. _____:

$$\text{Conc.} = \frac{(\quad)(\quad)(\quad)}{(\quad)(\quad)(\quad)}$$

= All Compounds ND

#	Sample ID	Compound	Reported Concentration ()	Calculated Concentration ()	Acceptable (Y/N)

Note: _____

LDC #: 3416 D3
SDG #: 484049

VALIDATION FINDINGS WORKSHEET
System Performance

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: g

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Was the system performance acceptable?

Professional judgement was applied to assess system performance as there are no specific criteria for system performance evaluation.

#	Date	Lab ID/Reference	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 39603
SDG #: 987-29

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: / of /
Reviewed: [Signature]
2nd Reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416D3
SDG #: 98H049

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: [Signature]
2nd reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Y (N) N/A
Y N (N/A)

Were field duplicate pairs identified in this SDG?

Were target compounds detected in thie field duplicate pairs?

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 3416D3
SDG #: 9PH049

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [Signature]
2nd reviewer: [Signature]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8080)

Y **N** **N/A** Were field blanks identified in this SDG?
 Y **N** **N/A** Were target compounds detected in the field blanks?

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ()

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: August 12, 1998
LDC Report Date: December 21, 1998
Matrix: Water
Parameters: Metals
Validation Level: NFESC Level C & D
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 98H049

Sample Identification

18609-965
18609-966**
18609-965MS
18609-965MSD

**Indicates sample underwent NFESC Level D review

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent a NFESC Level D review. A NFESC Level C review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level C criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found above the reporting limit in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
ICB	Antimony	55.0 ug/L	All samples in SDG 98H049
	Barium	1.26 ug/L	
	Beryllium	0.320 ug/L	
	Chromium	7.33 ug/L	
	Cobalt	8.55 ug/L	
	Copper	9.53 ug/L	
	Lead	-3.80 ug/L	
	Magnesium	68.1 ug/L	
	Nickel	10.2 ug/L	
	Potassium	1415 ug/L	
	Silver	9.70 ug/L	
	Vanadium	7.77 ug/L	
	Molybdenum	24.5 ug/L	
CCB1	Barium	1.64 ug/L	All samples in SDG 98H049
	Calcium	43.2 ug/L	
	Copper	2.71 ug/L	
	Lead	-1.79 ug/L	
	Potassium	846 ug/L	
	Selenium	4.03 ug/L	
	Vanadium	3.58 ug/L	
		Molybdenum	

Method Blank ID	Analyte	Concentration	Associated Samples
CCB2	Beryllium Copper Lead Nickel Potassium Selenium Silver Vanadium Molybdenum	0.380 ug/L 2.12 ug/L -1.20 ug/L 10.1 ug/L -1705 ug/L 3.48 ug/L 8.19 ug/L 3.51 ug/L 21.2 ug/L	All samples in SDG 98H049
CCB3	Barium Lead Nickel Potassium Molybdenum	0.870 ug/L -3.21 ug/L 12.1 ug/L -1227 ug/L 22.3 ug/L	All samples in SDG 98H049
CCB1	Selenium	4.72 ug/L	All samples in SDG 98H049
CCB3	Lead Thallium	-3.63 ug/L 10.2 ug/L	All samples in SDG 98H049
CCB1	Thallium	7.06 ug/L	All samples in SDG 98H049

Sample concentrations were compared to concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
18609-965	Molybdenum	41.5 ug/L	41.5U ug/L
18609-966**	Molybdenum	38.6 ug/L	38.6U ug/L

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

Although ICP serial dilution analysis was not required by the method, it was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

All sample result verifications met validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

**MCAS EI Toro
Metals - Data Qualification Summary - SDG 98H049**

No Sample Data Qualified in this SDG

**MCAS EI Toro
Metals - Laboratory Blank Data Qualification Summary - SDG 98H049**

SDG	Sample	Analyte	Modified Final Concentration	A or P
98H049	18609-965	Molybdenum	41.5U ug/L	A
98H049	18609-966**	Molybdenum	38.6U ug/L	A

METHOD: Metals (EPA SW 846 Method 6010/7000)
 Extra metals: _____

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/12/98
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS/LCSD
VIII.	Furnace Atomic Absorption QC	N	GFAA not used
IX.	ICP Serial Dilution	A	
X.	Sample Result Verification	A	Not reviewed for Level III/C validation.
XI.	Overall Assessment of Data	A	
XII.	Field Duplicates	N	
XIII.	Field Blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV/D validation

1	18609-965	AD	11		21	
2	18609-966**	↓	12		22	
3	18609-965MS		13		23	
4	18609-965MSD		14		24	
5	PBW		15		25	
6			16		26	
7			17		27	
8			18		28	
9			19		29	
10			20		30	

Notes: ADRL'S

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

All circled elements are applicable to each sample.

Sample ID	Matrix	Parameter
1	AD	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
2		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
3	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni , Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
4	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni , Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, CN, Mo, B

Comments: Hg - CVA

LDC #: 346 DL
SDG #: 98 H049

VALIDATION FINDINGS WORKSHEET Technical Holding Times

Page: 1 of 1
Reviewer: ms
2nd reviewer: W

Were samples preserved? N N/A
All circled dates have exceeded the technical holding time.
 N N/A Were all cooler temperatures within validation criteria?

METHOD: EPA SW 846 Method 6010/7000		(CVAA) Hg	(ICP) Al, Sb, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Mg, Mn, Ni, K, Ag, Na, V, Zn, Mo	(GFAA) ICP-trace	(GFAA) —	(GFAA) —	(GFAA) —	
Sample ID:	Sampling Date	Analysis Date	Analysis Date	Analysis Date	Analysis Date	Analysis Date	Analysis Date	Qualifier
1	8/2/98	8/4/98	8/15/98	8/14/98				NO UVA
2	↓	↓	↓	↓				↓
3	↓	↓	↓	↓				↓
4	↓	↓	↓	↓				↓

Technical Holding Time Criteria

Mercury: 28 days preserved pH < 2
All other metals: 6 months preserved pH < 2
Cyanide: 14 days preserved pH > 12
Organic lead: Extracted within 14 days of sampling, analyzed within 40 days of extraction. (no preservation)

LDC #: 34 54
 SDG #: 98H049

VALIDATION FINI (S) GS WORKSHEET Calibration

Page 1 of 1
 Reviewer: mg
 2nd Reviewer: h

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
- Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

- Y N N/A Was a midrange cyanide standard distilled?
- Y N N/A Are all correlation coefficients ≥ 0.995 ?
- Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data

Comments: _____

LDC #: 34634
SDG #: 98 17069

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: my
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
 True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated	Reported	Acceptable (Y/N)	
					%R	%R		
ICV	ICP (Initial calibration)	Mn	975.5	1000	98	98	Y	
ICV	GFAA (Initial calibration) ICP-trace	As	472.0	500	94	94		
ICV	CVAA (Initial calibration)	Hg	2.02	2.00	101	NR		
CCV	ICP (Continuing calibration)	Ni	1450	1500	97	97		
CCV5	GFAA (Continuing calibration) ICP-trace	Tl	411.3	400.0	103	103		
CCV1	CVAA (Continuing calibration)	Hg	4.93	5.00	98.6	NR		
	Cyanide (Initial calibration)							
	Cyanide (Continuing calibration)							

Comments: **Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.**

LDC #: 3416 D4
 SDG #: 98 H249

VALIDATION FINDINGS WORKSHEET
 PB/ICB/CCB QUALIFIED SAMPLES

Page: 1 of 1
 Reviewer: md
 2nd Reviewer: LA

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: _____

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: all

				Sample Identification											
Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	1	2										
Al															
Sb			55.0												
As															
Ba			1.64												
Be			0.38												
Cd															
Ca			43.2												
Cr			7.33												
Co			8.55												
Cu			9.53												
Fe															
Pb															
Mg			68.1												
Mn															
Hg															
Ni			12.1												
K			1415												
Se			4.72												
Ag			9.70												
Na															
Tl			10.2												
V															
Zn															
B															
Mo			24.5	41.5	38.6										
Sr															

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The () analyte concentration is the highest ICB, CCB, or PB detected in the analysis of () element.

LDC #: 34 Dd
SDG #: 98.049

VALIDATION FINDINGS WORKSHEET ICP Interference Check Sample

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were ICP interference check samples performed as required?
- N N/A Were the AB solution percent recoveries (%R) within the control limits of 80-120% ?

LEVEL IV ONLY:

- N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	ICS Identification	Analyte	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416 D4
 SDG #: 98 H049

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
 Reviewer: mf
 2nd Reviewer: [Signature]

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N/A Was a matrix spike analyzed for each matrix in this SDG?
 - N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? ^{80-120 LAB LIMITS} If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.
 - N/A Were all duplicate sample relative percent differences (RPD) $\leq 20\%$ for water samples and $\leq 35\%$ ^{≤ 20} for soil samples?
- LEVEL IV ONLY:**
- N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1		no MS/MSD	AQ	Hg				None	no qual. client-specified

Comments: _____

LDC #: 348 od
SDG #: 98 H049

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples (LCS)

Page 1 of 1
Reviewer: mt
2nd Reviewer: /

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?
- N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

- N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications

Comments: _____

LDC #: 3416 Dd
 SDG #: 98 H249

VALIDATION FINDINGS WORKSHEET
Furnace Atomic Absorption QC

Page: 1 of 1
 Reviewer: mf
 2nd Reviewer: A

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A If MSA was performed was the correlation coefficients ≥ 0.995 ?

LEVEL IV ONLY:

Y N N/A Do all applicable analyses have duplicate injections?

Y N N/A For sample concentrations > CRDL, are applicable duplicate injection RSD values <20% ?

Y N N/A Are analytical spike recoveries within the control limits of 85-115% ?

Sample ID	Findings				Criteria	Qualifications
	As	Pb	Se	Tl		

Comments: _____

LDC #: 341 st
SDG #: 981049

VALIDATION FINDINGS WORKSHEET ICP Serial Dilution

Page 1 of 1
Reviewer: mf
2nd Reviewer: /

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
- N N/A Were ICP serial dilution percent differences (%D) ≤ 10%?
- Y N N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

- N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications

Comments: _____

LDC #: 3416 D4
 SDG #: 98 H49

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
 Reviewer: my
 2nd Reviewer: H

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
 True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
 D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$$\%D = \frac{|I-SDR|}{I} \times 100$$

Where, I = Initial Sample Result (mg/L)
 SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units) <u>ug/L</u>	True / D / SDR (units) <u>ug/L</u>	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD / %D	%R / RPD / %D	
<u>Initial ICS AB</u>	ICP interference check	<u>mo</u>	<u>993.7</u>	<u>1000</u>	<u>99.4</u>	<u>99</u>	<u>Y</u>
<u>LCS</u>	Laboratory control sample	<u>Hg</u>	<u>4.86</u>	<u>5.00</u>	<u>97.2</u>	<u>97</u>	↓
<u>3</u>	Matrix spike	<u>Pb</u>	(SSR-SR) <u>1135</u>	<u>1000</u>	<u>113.5</u>	<u>113</u>	
<u>4</u>	Duplicate <u>ms/msD</u>	<u>Se</u>	<u>1029</u>	<u>1004</u>	<u>2</u>	<u>2</u>	
<u>1</u>	ICP serial dilution	<u>Mg</u>	<u>7447</u>	<u>7770</u>	<u>4</u>	<u>4</u>	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 5416 D4
 SDG #: 98 H069

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
 Reviewer: my
 2nd reviewer: /

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Have results been reported and calculated correctly?
 N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
 Y N N/A Are all detection limits below the CRDL?

Detected analyte results for 2 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In. Vol.)}$

Recalculation:

- RD = Raw data concentration
 FV = Final volume (ml)
 In. Vol. = Initial volume (ml) or weight (G)
 Dil = Dilution factor

$Ca = \frac{(20.38 \text{ mg/L})(50 \text{ ml})(1000 \text{ } \mu\text{g/L/mg})}{50 \text{ ml}} = 20400$

#	Sample ID	Analyte	Reported Concentration ($\mu\text{g/L}$)	Calculated Concentration ($\mu\text{g/L}$)	Acceptable (Y/N)
1	2	Ca	30400	30400	Y
		Mg	7020	7020	Y
		Mn	56600	56600	Y
		Zn	38.6	38.6	Y

Note: _____

LDC #: 3416 DL
 SDG #: 98 H019

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
 Reviewer: mjg
 2nd Reviewer: JA

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualification

Comments: _____

LDC #: 341634
SDG #: 98H249

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: mf
2nd reviewer: [Signature]

METHOD: Trace Metals (EPA SW 846 Method 6010:7000)

N/A Were field duplicate pairs identified in this SDG?
 N N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration ()		RPD (Limits)	Difference (Limits)	Qualifications
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					
Boron					
Molybdenum					
Strontium					

Notes: _____

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: August 12, 1998
LDC Report Date: December 21, 1998
Matrix: Water
Parameters: Cyanide
Validation Level: NFESC Level C & D
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 98H049

Sample Identification

18609-965
18609-966**
18609-966DUP

**Indicates sample underwent NFESC Level D review

Introduction

This data review covers 3 water samples listed on the cover sheet. The analyses were per EPA SW 846 Method 9010A for Cyanide.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Samples indicated by a double asterisk on the front cover underwent a NFESC Level D review. A NFESC Level C review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level C criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration verification

Calibration verification frequency and analysis criteria were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No cyanide contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike analyses specified for the samples in this SDG and therefore matrix spike analyses were not performed for this SDG.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) were within QC limits.

b. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Sample Result Verification

All sample result verifications were within validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

VI. Overall Assessment of Data

Data flags are summarized at the end of this report.

VII. Field Duplicates

No field duplicates were identified in this SDG.

VIII. Field Blanks

No field blanks were identified in this SDG.

**MCAS El Toro
Cyanide - Data Qualification Summary - SDG 98H049**

No Sample Data Qualified in this SDG

**MCAS El Toro
Cyanide - Laboratory Blank Data Qualification Summary - SDG 98H049**

No Sample Data Qualified in this SDG

METHOD: Cyanide (EPA SW 846 Method 9010A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>8/12/98</u>
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IVa.	Matrix Spike/(Matrix Spike) Duplicates	A	<u>no ms. no qual. client - spec.</u>
IVb.	Laboratory control samples	A	<u>LCS/LCSD</u>
V.	Sample result verification	A	Not reviewed for Level III/C validation.
VI.	Overall assessment of data	A	
VII.	Field duplicates	N	
VIII.	Field blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinstate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV/D validation

1	18609-965	AQ	11		21	
2	18609-966**		12		22	
3	18609-966DUP		13		23	
4	MB		14		24	
5			15		25	
6			16		26	
7			17		27	
8			18		28	
9			19		29	
10			20		30	

Notes: _____

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

All circled dates have exceeded the technical holding time.

N/A Were all samples preserved as applicable to each method?

N/A Were all cooler temperatures within validation criteria?

Method:		EPA 9010					
Parameters:		CN-					
Technical holding time:		14 days					
Sample ID	Sampling date	Analysis date	Qualifier				
1	8/12/98	8/15/98					no qual
2	↓	↓					↓
3	↓	↓					↓

DC #: 346 D16
SDG #: 9817049

VALIDATION FINDINGS WORKSHEET

Calibration

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
 N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110%?
 N N/A Are all correlation coefficients ≥ 0.995 ?

LEVEL IV/D ONLY:

- N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.
Y N N/A Was a balance check conducted prior to the TDS analysis?
Y N N/A Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications

Comments:

LDC #: 3416 D16
 SDG #: 98 11049

VALIDATION FINDINGS WORKSHEET

Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
 Reviewer: my
 2nd Reviewer: h

METHOD: Inorganics, Method CN⁻

The correlation coefficient (r) for the calibration of CN⁻ was recalculated. Calibration date: 8/15/98

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
 True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard ID	Found (units)	True (units)	Recalculated	Reported	Acceptable (Y/N)
					r or %R	r or %R	
Initial calibration	CN ⁻	Blank	0.000 ^{abs}	0.00	r ² = 0.9997	r ² = 0.9996	Y
		Standard 1	0.014	10			
		Standard 2	0.027	20			
		Standard 3	0.071	50			
		Standard 4	0.142	100			
		Standard 5	0.209	150			
Calibration verification	↓	Std. 6	0.275	200			↓
Calibration verification	↓	ICV	0.099	0.100	99	NR	↓
Calibration verification	↓	CCV1	0.101	0.100	101	↓	↓

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 346 D16
SDG #: 98 H049

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: ms
2nd Reviewer: [Signature]

METHOD: Inorganics, Method CN-

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Were all samples associated with a given method blank?

N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: _____

Associated Samples: _____

Analyte	Blank ID	Sample Identification							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

DC #: 3416 D16
SDG #: 9811049

VALIDATION FINDINGS WORKSHEET

Duplicate Analysis

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: Inorganics, Method CV-

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?
 Y N N/A Were all duplicate sample relative percent differences (RPD) $\leq 20\%$ for water and $\leq 35\%$ for soil samples ($\leq 10\%$ for Method 300.0)? If no, see qualification below. A control limit of $\pm CRDL$ ($\pm 2X CRDL$ for soil) was used for samples that were $\leq 5X$ the CRDL, including when only one of the duplicate sample values were $\leq 5X$ the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

- Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Associated Samples	Qualifications

Comments: _____



DC #: 341216
 SDG #: 981249

VALIDATION FINDINGS WORKSHEET
 Laboratory Control Samples (LCS)

Page: 1 of 1
 Reviser: mf
 2nd Reviewer: ff

METHOD: Inorganics, Method CN

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?
 N N/A Were all LCS percent recoveries (%R) within the control limits of 80-120% (85-115% for Method 300.0)?

LEVEL IV ONLY:
 N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications

Comments:

LDC #: 3416 D14
 SDG #: 98 H049

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
 Reviewer: mf
 2nd Reviewer: lf

METHOD: Inorganics, Method CN⁻

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{\text{Found}}{\text{True}} \times 100$ Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
 True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
 D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units) <i>mg/L</i>	True / D (units) <i>mg/L</i>	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
Les	Laboratory control sample	CN ⁻	0.104	0.100	104	104	Y
	Matrix spike sample	↓	(SSR-SR) U/A				
3	Duplicate sample	↓	ND				

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3416 D14
 SDG #: 98 H049

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416 D16
SDG #: 98 A249

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: 1 of 1
Reviewer: *mf*
2nd reviewer: *JA*

Method: Inorganics, Method CN⁻

Y (N/N/A) Were field duplicate pairs identified in this SDG?
Y N (N/A) Were target analytes detected in the field duplicate pairs?

Analyte	Concentration ()		RPD

Analyte	Concentration ()		RPD

LDC #: 3416016
SDG #: 92H049

VALIDATION FINDINGS WORKSHEET

Field Blanks

Page: 1 of 1
Reviewer: [Signature]
2nd reviewer: [Signature]

METHOD: Inorganics, EPA Method See cover

Y N/A Were field blanks identified in this SDG?
Y N/A Were target analytes detected in the field blanks?

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Analyte	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Analyte	Concentration Units ()

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: MCAS EI Toro
Collection Date: August 12, 1998
LDC Report Date: March 2, 1999
Matrix: Water
Parameters: Metals
Validation Level: NFESC Level C & D
Laboratory: EMAX Laboratories, Inc.

Sample Delivery Group (SDG): 98H049

Sample Identification

18609-965
18609-966**
18609-965MS
18609-965MSD

**Indicates sample underwent NFESC Level D review
An asterisk (*) will be placed in the margin to the left of any revised item in the text.

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Samples indicated by a double asterisk on the front cover underwent a NFESC Level D review. A NFESC Level C review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Level C criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found above the reporting limit in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
ICB	Antimony	55.0 ug/L	All samples in SDG 98H049
	Barium	1.26 ug/L	
	Beryllium	0.320 ug/L	
	Chromium	7.33 ug/L	
	Cobalt	8.55 ug/L	
	Copper	9.53 ug/L	
	Lead	-3.80 ug/L	
	Magnesium	68.1 ug/L	
	Nickel	10.2 ug/L	
	Potassium	1415 ug/L	
	Silver	9.70 ug/L	
	Vanadium	7.77 ug/L	
	Molybdenum	24.5 ug/L	
CCB1	Barium	1.64 ug/L	All samples in SDG 98H049
	Calcium	43.2 ug/L	
	Copper	2.71 ug/L	
	Lead	-1.79 ug/L	
	Potassium	846 ug/L	
	Selenium	4.03 ug/L	
	Vanadium	3.58 ug/L	
	Molybdenum	15.2 ug/L	

Method Blank ID	Analyte	Concentration	Associated Samples
CCB2	Beryllium Copper Lead Nickel Potassium Selenium Silver Vanadium Molybdenum	0.380 ug/L 2.12 ug/L -1.20 ug/L 10.1 ug/L -1705 ug/L 3.48 ug/L 8.19 ug/L 3.51 ug/L 21.2 ug/L	All samples in SDG 98H049
CCB3	Barium Lead Nickel Potassium Molybdenum	0.870 ug/L -3.21 ug/L 12.1 ug/L -1227 ug/L 22.3 ug/L	All samples in SDG 98H049
CCB1	Selenium	4.72 ug/L	All samples in SDG 98H049
CCB3	Lead Thallium	-3.63 ug/L 10.2 ug/L	All samples in SDG 98H049
CCB1	Thallium	7.06 ug/L	All samples in SDG 98H049

*Sample concentrations were compared to concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

Although ICP serial dilution analysis was not required by the method, it was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

All sample result verifications met validation criteria for samples on which a NFESC Level D review was performed. Raw data were not evaluated for the samples reviewed by Level C criteria.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

**MCAS El Toro
Metals - Data Qualification Summary - SDG 98H049**

No Sample Data Qualified in this SDG

**MCAS El Toro
Metals - Laboratory Blank Data Qualification Summary - SDG 98H049**

*

No Sample Data Qualified in this SDG

METHOD: Metals (EPA SW 846 Method 6010/7000)
 Extra metals: _____

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/12/98
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS/LCSD
VIII.	Furnace Atomic Absorption QC	N	GFAA not used
IX.	ICP Serial Dilution	A	
X.	Sample Result Verification	A	Not reviewed for Level III/C validation.
XI.	Overall Assessment of Data	A	
XII.	Field Duplicates	N	
XIII.	Field Blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV/D validation

1	18609-965	AD	11		21	
2	18609-966**	↓	12		22	
3	18609-965MS		13		23	
4	18609-965MSD		14		24	
5	PBW		15		25	
6			16		26	
7		17		27		
8		18		28		
9		19		29		
10		20		30		

Notes: ADRL'S

35

LDC #: 346Dd
SDG #: 9817049

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: mz
2nd reviewer: W

Were samples preserved? Y N N/A
All circled dates have exceeded the technical holding time.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD: EPA SW 846 Method 6010/7000		(CVAA) Hg	(ICP) Al, Sb, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Mg, Mn, Ni, K, Ag, Na, V, Zn, <u>Mo</u>	(GFAA) <u>ICP-trail</u> As, Pb, Se, Tl	(GFAA) —	(GFAA) —	(GFAA) —	
Sample ID:	Sampling Date	Analysis Date	Analysis Date	Analysis Date	Analysis Date	Analysis Date	Analysis Date	Qualifier
1	8/12/98	8/14/98	8/15/98	8/14/98				NO U/A
2	↓	↓	↓	↓				↓
3	↓	↓	↓	↓				↓
4	↓	↓	↓	↓				↓

Technical Holding Time Criteria

- Mercury: 28 days preserved pH < 2
- All other metals: 6 months preserved pH < 2
- Cyanide: 14 days preserved pH > 12
- Organic lead: Extracted within 14 days of sampling, analyzed within 40 days of extraction. (no preservation)

LDC #: 341024
SDG #: 981049

VALIDATION FINDINGS WORKSHEET
Calibration

Page: 1 of 1
Reviewer: mf
2nd Reviewer: h

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Y N N/A Was a midrange cyanide standard distilled?

Y N N/A Are all correlation coefficients ≥ 0.995 ?

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data

Comments: _____

LDC #: 34624
 SDG #: 98 H069

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
 Reviewer: mf
 2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
 True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated	Reported	Acceptable (Y/N)
					%R	%R	
ICV	ICP (Initial calibration)	Mn	975.5	1000	98	98	Y
ICV	GFAA (Initial calibration) ICP-trace	As	420	500	94	94	
ICV	CVAA (Initial calibration)	Hg	2.02	2.00	101	NR	
CCV	ICP (Continuing calibration)	Ni	1450	1500	97	97	
CCV5	GFAA (Continuing calibration) ICP-trace	Tl	411.3	400.0	103	103	
CCV1	CVAA (Continuing calibration)	Hg	4.93	5.00	98.6	NR	
	Cyanide (Initial calibration)						
	Cyanide (Continuing calibration)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 341624
SDG #: 98H249

VALIDATION FINDINGS WORKSHEET
Prep Blank/ICB/CCB Findings

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Blank concentration units, unless otherwise noted: $\mu\text{g/L}$ Associated Samples: *all*

Analyte	Blank Identification										Analyte
	ICB	CCB1	CCB2	CCB3	PB ()	ICB	CCB1	CCB2	CCB3	PB ()	
Al											Al
Sb	55.0										Sb
As											As
Ba	1.26	1.64		0.870							Ba
Be	0.320	*	0.380								Be
Cd											Cd
Ca		43.2									Ca
Cr	7.33										Cr
Co	8.55										Co
Cu	9.53	2.71	9.12								Cu
Fe											Fe
Pb	-3.80	-1.79	-1.20	-3.21					-3.63		Pb
Mg	68.1										Mg
Mn											Mn
Hg											Hg
Ni	10.2		10.1	12.1							Ni
K	1415	846	-1705	-1227							K
Se	*	4.03	3.48			4.72					Se
Ag	9.70		8.19								Ag
Na											Na
Tl									10.2	7.06	Tl
V	7.77	3.58	3.51								V
Zn											Zn
B											B
Mo	24.5	15.2	21.2	22.3							Mo
Sr											Sr

The highest concentration found in the Prep Blank and ICB/CCB for each analyte is circled on this worksheet and transferred to the PB/ICB/CCB Qualified Samples worksheet.

LDC #: 341624
 SDG #: 98H049

VALIDATION FINDINGS WORKSHEET ICP Interference Check Sample

Page: 1 of 1
 Reviewer: mf
 2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were ICP interference check samples performed as required?
- N N/A Were the AB solution percent recoveries (%R) within the control limits of 80-120% ?

LEVEL IV ONLY:

- N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	ICS Identification	Analyte	Finding	Associated Samples	Qualifications

Comments: _____

LDC #: 3416 dt
 SDG #: 981049

VALIDATION FINDINGS WORKSHEET ICP Serial Dilution

Page: 1 of 1
 Reviewer: *mjt*
 2nd Reviewer: *[Signature]*

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
- N N/A Were ICP serial dilution percent differences (%D) ≤ 10%?
- Y N N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

- N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications

Comments: _____

LDC #: 3416 Df
 SDG #: 98 M49

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
 Reviewer: mf
 2nd Reviewer: [Signature]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
 True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
 D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$$\%D = \frac{|I-SDR|}{I} \times 100$$

Where, I = Initial Sample Result (mg/L)
 SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units) <i>mg/L</i>	True / D / SDR (units) <i>mg/L</i>	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD / %D	%R / RPD / %D	
<i>Initial ICS AB</i>	ICP interference check	<i>mo</i>	<i>993.7</i>	<i>1000</i>	<i>99.4</i>	<i>99</i>	<i>Y</i>
<i>LCS</i>	Laboratory control sample	<i>Hg</i>	<i>4.86</i>	<i>5.00</i>	<i>97.2</i>	<i>97</i>	↓
<i>3</i>	Matrix spike	<i>Pb</i>	<i>1135</i> <small>(SSR-SR)</small>	<i>1000</i>	<i>113.5</i>	<i>113</i>	
<i>4</i>	Duplicate <i>ms/msD</i>	<i>Be</i>	<i>1029</i>	<i>1004</i>	<i>2</i>	<i>2</i>	
<i>1</i>	ICP serial dilution	<i>Mg</i>	<i>7447</i>	<i>7770</i>	<i>4</i>	<i>4</i>	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 246D4
SDG #: 98H069

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: my
2nd reviewer: //

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y N N/A Have results been reported and calculated correctly?
- Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
- Y N N/A Are all detection limits below the CRDL?

Detected analyte results for 2 were recalculated and verified using the following equation:

$$\text{Concentration} = \frac{(\text{RD})(\text{FV})(\text{Dil})}{(\text{In. Vol.})}$$

Recalculation:

- RD = Raw data concentration
- FV = Final volume (ml)
- In. Vol. = Initial volume (ml) or weight (G)
- Dil = Dilution factor

$$Ca = \frac{(20.38 \text{ mg/L})(50 \text{ ml})(1000 \text{ mg/L})}{50 \text{ ml}} = 20400$$

#	Sample ID	Analyte	Reported Concentration (µg/L)	Calculated Concentration (µg/L)	Acceptable (Y/N)
1	2	Ca	30400	30400	✓
		Mg	7020	7020	↓
		Mn	56600	56600	
		Zn	38.6	38.6	

Note: _____

LDC #: 3.6 DL
 SDG #: 98 H049

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
 Reviewer: mg
 2nd Reviewer: [Signature]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualification

Comments: _____

LDC #: 341684
 SDG #: 98 H249

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: mf
 2nd reviewer: jh

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

~~N~~ N/A Were field duplicate pairs identified in this SDG?
 ~~N~~ N/A Were target analytes detected in the field duplicate pairs?

Analyte	Concentration ()		RPD (Limits)	Difference (Limits)	Qualifications
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Mercury					
Nickel					
Potassium					
Selenium					
Silver					
Sodium					
Thallium					
Vanadium					
Zinc					
Cyanide					
Boron					
Molybdenum					
Strontium					

Notes: _____

SDG #: 301624
SDG #: 9817049

VALIDATION FINDINGS WORKSHEET

Field Blanks

Page: 1 of 1
Reviewer: msf
2nd reviewer: JA

METHOD: Trace Metals (EPA SW 846 Method 6010-7000)

N/A Were field blanks identified in this SDG?
 N/A Were target analytes detected in the field blanks?

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Analyte	Concentration Units ()

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Analyte	Concentration Units ()

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: October 17, 1997
LDC Report Date: June 30, 1998
Matrix: Soil/Water
Parameters: Total Petroleum Hydrocarbons as Gasoline
Validation Level: NFESC Level C
Laboratory: VOC Analytical Laboratories, Inc.
Sample Delivery Group (SDG): G9710389

Sample Identification

18609-638
18609-640
18609-642
18609-637

Introduction

This data review covers 2 soil samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Sample 18609-642 was identified as a rinsate. No total petroleum hydrocarbons as gasoline contaminants were found in this blank with the following exceptions:

Rinsate ID	Compound	Concentration (mg/L)
18609-642	TPH as gasoline	0.055

Sample 18609-637 was identified as a trip blank. No total petroleum hydrocarbons as gasoline contaminants were found in this blank.

MCAS El Toro
Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG G9710389

No Sample Data Qualified in this SDG

MCAS El Toro
Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG G9710389

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: October 17, 1997
LDC Report Date: June 29, 1998
Matrix: Soil/Water
Parameters: Total Petroleum Hydrocarbons as Extractables
Validation Level: NFESC Level C
Laboratory: VOC Analytical Laboratories, Inc.
Sample Delivery Group (SDG): G9710389

Sample Identification

18609-638
18609-640
18609-642

Introduction

This data review covers 2 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Sample 18609-642 was identified as a rinsate. No total petroleum hydrocarbons as extractable contaminants were found in this blank.

MCAS El Toro
Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG G9710389

No Sample Data Qualified in this SDG

MCAS El Toro
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG G9710389

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: October 17, 1997
LDC Report Date: June 29, 1998
Matrix: Soil/Water
Parameters: Volatiles
Validation Level: NFESC Level C
Laboratory: VOC Analytical Laboratories, Inc.
Sample Delivery Group (SDG): G9710389

Sample Identification

18609-638
18609-640
18609-642
18609-637
18609-639
18609-641
18609-638MS
18609-638MSD

Introduction

This data review covers 6 soil samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260A for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

The samples were analyzed after the BFB tuning. The instrument performance check could not be verified at the 12 hour interval.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

Average relative response factors (RRF) for all volatile target compounds and system monitoring compounds were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
9/10/97	Acetone Vinyl acetate	0.047 (≥ 0.05) 0.046 (≥ 0.05)	All soil samples in SDG G9710389	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A
10/8/97	Acetone Vinyl acetate 2-Butanone	0.019 (≥ 0.05) 0.025 (≥ 0.05) 0.029 (≥ 0.05)	All water samples in SDG G9710389	J (all detects) R (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds with the following exceptions:

Date	Compound	%D (Limits)	Associated Samples	Flag	A or P
10/20/97 (B1816)	Carbon disulfide 2-Butanone 2-Chloroethylvinyl ether	50.3 (≤ 50) 68.0 (≤ 50) 57.9 (≤ 50)	All soil samples in SDG G9710389	J J J	A
10/20/97 (A1426)	2-Chloroethylvinyl ether	90.4 (≤ 50)	B71011361	J	A
10/21/97	2-Chloroethylvinyl ether	69.2 (≤ 50)	18609-642 18609-637	J	A

All of the continuing calibration RRF values were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/20/97 (B1816)	Vinyl acetate	0.036 (≥ 0.05)	All soil samples in SDG G9710389	J (all detects) R (all non-detects)	A
10/20/97 (A1426)	Acetone Vinyl acetate 2-Butanone Carbon tetrachloride	0.021 (≥ 0.05) 0.028 (≥ 0.05) 0.035 (≥ 0.05) 0.001 (≥ 0.05)	B71011361	J (all detects) R (all non-detects)	A
10/21/97	Acetone Vinyl acetate 2-Butanone	0.021 (≥ 0.05) 0.022 (≥ 0.05) 0.038 (≥ 0.05)	18609-642 18609-637	J (all detects) R (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All water samples in SDG G9710389	All TCL compounds	Method blank associated with these samples was not run within the same 12 hour shift.	Method blanks must be run within the same 12 hour shift.	None	P

No volatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
B711011361	10/20 97	Acetone	6.7 ug/L	All water samples in SDG G9710389

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
18609-642	Acetone	22 ug/L	50U ug/L

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
18609-638MS/MSD (All soil samples in SDG G9710389)	1,1-Dichloroethene	64 (65-135)	62 (65-135)	-	J	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG G9710389	All TCL compounds	The LCS was analyzed as a continuing calibration standard.	The LCS should be analyzed independently from the calibration.	None	P

Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample 18609-637 was identified as a trip blank. No volatile contaminants were found in this blank.

Sample 18609-642 was identified as a rinsate. No volatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Compound	Concentration (ug/L)
18609-642	Acetone	22

MCAS EI Toro
 Volatiles - Data Qualification Summary - SDG G9710389

SDG	Sample	Compound	Flag	A or P	Reason
G9710389	18609-638 18609-640 18609-639 18609-641	Acetone Vinyl acetate	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A	Initial calibration (RRF)
G9710389	18609-642 18609-637	Acetone Vinyl acetate 2-Butanone	J (all detects) R (all non-detects)	A	Initial calibration (RRF)
G9710389	18609-638 18609-640 18609-639 18609-641	Carbon disulfide 2-Butanone 2-Chloroethylvinyl ether	J J J	A	Continuing calibration (%D)
G9710389	18609-642 18609-637	2-Chloroethylvinyl ether	J	A	Continuing calibration (%D)
G9710389	18609-638 18609-640 18609-639 18609-641	Vinyl acetate	J (all detects) R (all non-detects)	A	Continuing calibration (RRF)
G9710389	18609-642 18609-637	Acetone Vinyl acetate 2-Butanone	J (all detects) R (all non-detects)	A	Continuing calibration (RRF)
G9710389	18609-642 18609-637	All TCL compounds	None	P	Method blanks
G9710389	18609-638 18609-640 18609-639 18609-641	1,1-Dichloroethene	J	A	Matrix spike/Matrix spike duplicates (%R)
G9710389	18609-638 18609-640 18609-642 18609-637 18609-639 18609-641	All TCL compounds	None	P	Laboratory control samples

MCAS El Toro
Volatiles - Laboratory Blank Data Qualification Summary - SDG G9710389

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
G9710389	18609-642	Acetone	50U ug/L	A

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: October 17, 1997
LDC Report Date: June 29, 1998
Matrix: Soil/Water
Parameters: Semivolatiles
Validation Level: NFESC Level C
Laboratory: VOC Analytical Laboratories, Inc.

Sample Delivery Group (SDG): G9710389

Sample Identification

18609-638
18609-640
18609-642
18609-638MS
18609-638MSD

Introduction

This data review covers 4 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270B for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

The samples were analyzed after the DFTPP tuning. The instrument performance check could not be verified at the 12 hour interval.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

An incorrect initial calibration was provided by the laboratory for all samples. The corrected initial calibration data could not be attained from the laboratory, therefore the initial calibration could not be reviewed.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Since an incorrect initial calibration was provided by the laboratory, for all samples, the associated continuing calibration data could not be reviewed.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
B7101201*1*MB	10/21/97	Di-n-butylphthalate Bis(2-ethylhexyl)phthalate Di-n-octylphthalate Diethylphthalate Fluorantnene Pyrene	10 ug/L 2.8 ug/L 0.38 ug/L 0.51 ug/L 0.15 ug/L 0.14 ug/L	All water samples in SDG G9710389
B7101647*1*MB	10/27/97	Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	130 ug/Kg 28 ug/Kg	All soil samples in SDG G9710389

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X

for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
18609-642	Di-n-butylphthalate	6.4 ug/L	10U ug/L
18609-640	Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	260 ug/Kg 190 ug/Kg	340U ug/Kg 340U ug/Kg

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable with the following exceptions:

Samples	Compound	Finding	Criteria	Flag	A or P
All samples in SDG G9710389	N-Nitroso-di-n-propylamine	The MS/MSD associated with these samples was not spiked with this compound.	The MS/MSD must be performed according to the QAPP.	None	P

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable with the following exceptions:

Samples	Compound	Finding	Criteria	Flag	A or P
All samples in SDG G9710389	N-Nitroso-di-n-propylamine	The LCS/LCSD associated with these samples was not spiked with this compound.	The LCS/LCSD must be performed according to the QAPP.	None	P

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
C7102308*1*LC/LCD (All water samples in SDG G9710389)	4-Nitrophenol	-	-	25 (≤ 20)	J	A
C7103173*1*LC/LCD (All soil samples in SDG G9710389)	1,2,4-Trichlorobenzene	-	-	41 (≤ 30)	J	A
	1,4-Dichlorobenzene	-	-	41 (≤ 30)	J	
	2,4-Dinitrotoluene	-	-	37 (≤ 30)	J	
	2-Chlorophenol	-	-	37 (≤ 30)	J	
	4-Chloro-3-methylphenol	-	-	34 (≤ 30)	J	
	4-Nitrophenol	-	-	36 (≤ 30)	J	
	Acenaphthene	-	-	37 (≤ 30)	J	
	Phenol	-	-	34 (≤ 30)	J	
	Pentachlorophenol	-	-	34 (≤ 30)	J	
	Pyrene	-	-	32 (≤ 30)	J	

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags have been summarized at the end of the report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks -

Sample 18609-642 was identified as a rinsate. No semivolatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Compound	Concentration (ug/L)
18609-642	Di-n-butylphthalate	6.4

**MCAS El Toro
Semivolatiles - Data Qualification Summary - SDG G9710389**

SDG	Sample	Compound	Flag	A or P	Reason
G9710389	18609-638 18609-640 18609-642	N-Nitroso-di-n-propylamine	None	P	Matrix spike/Matrix spike duplicates
G9710389	18609-638 18609-640 18609-642	N-Nitroso-di-n-propylamine	None	P	Laboratory control samples
G9710389	18609-642	4-Nitrophenol	J	A	Laboratory control samples (RPD)
G9710389	18609-638 18609-640	1,2,4-Trichlorobenzene 1,4-Dichlorobenzene 2,4-Dinitrotoluene 2-Chlorophenol 4-Chloro-3-methylphenol 4-Nitrophenol Acenaphthene Phenol Pentachlorophenol Pyrene	J J J J J J J J J J	A	Laboratory control samples (RPD)

**MCAS El Toro
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG G9710389**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
G9710389	18609-642	Di-n-butylphthalate	10U ug/L	A
G9710389	18609-640	Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	340U ug/Kg 340U ug/Kg	A

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: October 17, 1997
LDC Report Date: July 1, 1998
Matrix: Soil/Water
Parameters: Chlorinated Pesticides & PCBs
Validation Level: NFESC Level C
Laboratory: VOC Analytical Laboratories, Inc.
Sample Delivery Group (SDG): G9710389

Sample Identification

18609-638
18609-640
18609-642

Introduction

This data review covers 2 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081 for Chlorinated Pesticides and PCBs.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance check data were not provided and therefore not reviewed.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The individual 4,4'-DDT and Endrin breakdowns were less than 20.0% .

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide or PCB contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the

following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
97195LCS/LCSD (All water samples in SDG G9710389)	gamma-BHC	-	-	43 (≤30)	J	A
	Heptachlor	-	-	43 (≤30)	J	
	Aldrin	-	-	42 (≤30)	J	
	Dieldrin	-	-	38 (≤30)	J	
	Endrin	-	-	36 (≤30)	J	
	4,4'-DDT	-	-	42 (≤30)	J	

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Sample 18609-642 was identified as a rinsate. No chlorinated pesticide or PCB contaminants were found in this blank.

MCAS EI Toro
 Chlorinated Pesticides & PCBs - Data Qualification Summary - SDG G9710389

SDG	Sample	Compound	Flag	A or P	Reason
G9710389	18609-642	gamma-BHC Heptachlor Aldrin Dieldrin Endrin 4,4'-DDT	J J J J J J	A	Laboratory control samples (RPD)

MCAS EI Toro
 Chlorinated Pesticides & PCBs - Laboratory Blank Data Qualification Summary - SDG G9710389

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: MCAS El Toro
Collection Date: October 17, 1997
LDC Report Date: June 30, 1998
Matrix: Soil/Water
Parameters: Metals & Cyanide
Validation Level: NFESC Level C
Laboratory: VOC Analytical Laboratories, Inc.
Sample Delivery Group (SDG): G9710389

Sample Identification

18609-638
18609-640
18609-642
18609-642MS
18609-642MSD

Introduction

This data review covers 4 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals and EPA SW 846 Method 9010A for Cyanide. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG G9710389	Cyanide	Calibration verification not performed at the required frequencies.	Calibration verification should be performed immediately following initial calibration and once every ten samples.	None	P

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found above the reporting limit in the initial, continuing and preparation blanks.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
9710388*1MS/MSD (18609-638 18609-640)	Selenium	15 (73-122)	19 (73-122)	-	J (all detects) R (all non-detects)	A
9710388*1MS/MSD (18609-638 18609-640)	Silver Barium Magnesium Arsenic Mercury	79 (80-120) 69 (80-120) 125 (80-120) 69 (74-120) -	- - - 59 (74-120) 75 (77-120)	- - - - -	J J J (all detects) J J	A
9710378*1MS/MSD (18609-642)	Selenium	64 (73-122)	65 (73-122)	-	J	A

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption QC were not reviewed for this SDG.

X. ICP Serial Dilution

Although ICP serial dilution analysis was not required by the method, it was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

Sample 18609-642 was identified as a rinsate. No metal or cyanide contaminants were found in this blank with the following exceptions:

Rinsate ID	Analyte	Concentration (ug/L)
18609-642	Barium Calcium Iron Magnesium Sodium	1.7 3.0 29 83 330

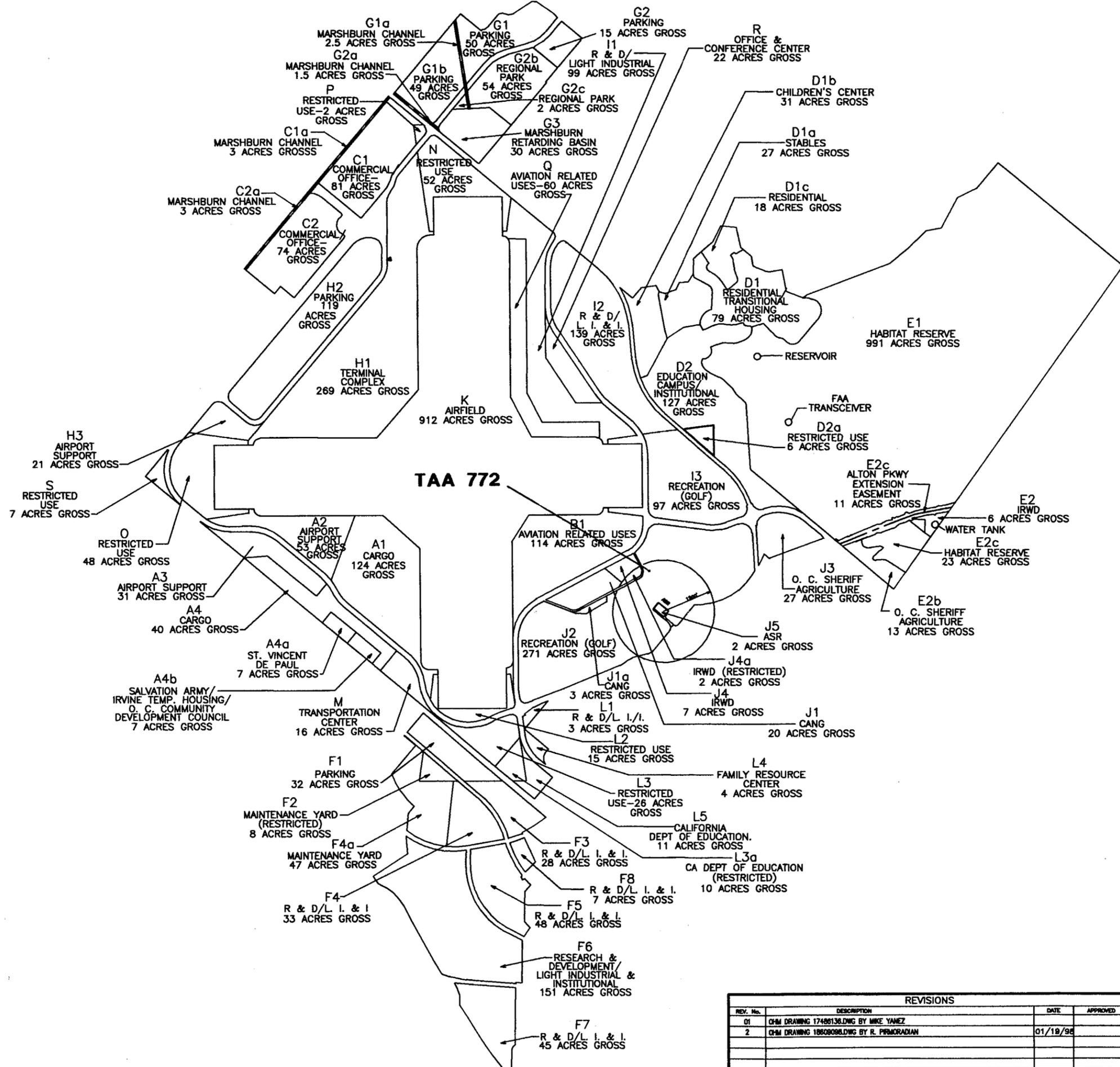
**MCAS EI Toro
Metals & Cyanide - Data Qualification Summary - SDG G9710389**

SDG	Sample	Analyte	Flag	A or P	Reason
G9710389	18609-638 18609-640 18609-642	Cyanide	None	P	Calibration
G9710389	18609-638 18609-640	Selenium	J (all detects) R (all non-detects)	A	Matrix spike analysis (%R)
G9710389	18609-638 18609-640	Silver Barium Magnesium Arsenic Mercury	J J J (all detects) J J	A	Matrix spike analysis (%R)
G9710389	18609-642	Selenium	J	A	Matrix spike analysis (%R)

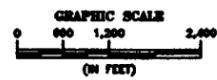
**MCAS EI Toro
Metals & Cyanide - Laboratory Blank Data Qualification Summary - SDG G9710389**

No Sample Data Qualified in this SDG

Appendix I
Tentative Reuse Parcel Location of TAA 772

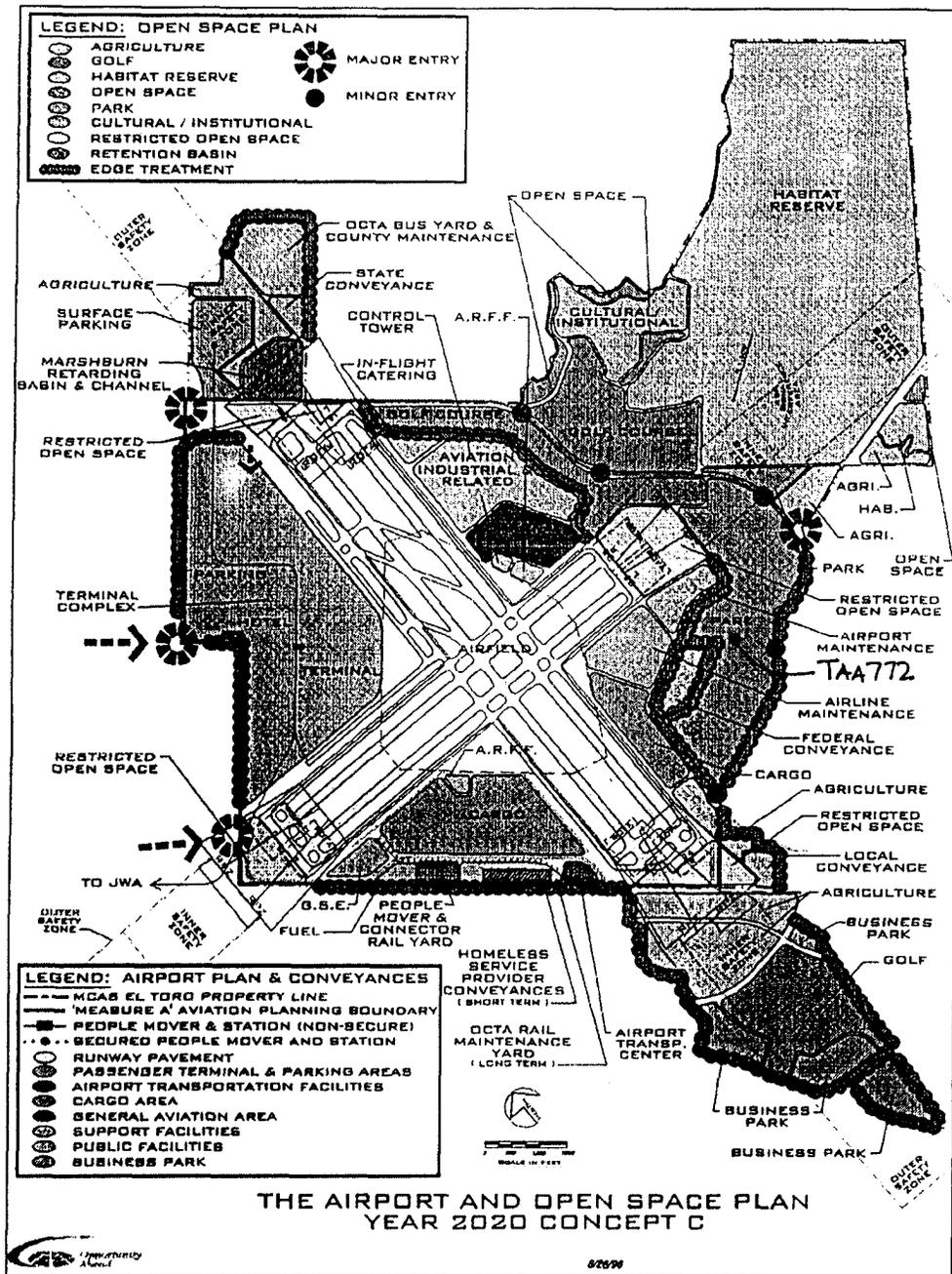


Nov 09, 1999 11:56:16 I:\OHM CORP\PROJECTS\18609\18609273.dwg



REVISIONS			
REV. No.	DESCRIPTION	DATE	APPROVED
01	OHM DRAWING 17498136.DWG BY MIKE YANEZ		
2	OHM DRAWING 18609273.DWG BY R. PIRMORADIAN	01/19/98	

PROJECT SWDIV		OHM Remediation Services Corp. A Subsidiary of OHM Corporation SAN DIEGO, CA	
DRAWN BY R. PIRMORADIAN	DATE 11/09/99	EL TORO COMMUNITY REUSE PLAN 1997 WORKING MAP LAND USES/ CONVEYANCES GROSS ACRES TAA 772	
CHECKED BY DR	DATE 12/16/99	MARINE CORPS AIR STATION EL TORO, CALIFORNIA	
APPROVED BY	DATE		
PROJECT MANAGER	DATE		
AUTOCAD FILE No. 18609273.DWG		SCALE 1"=2,400'	SHEET 1
		OF 1	DOCUMENT CONTROL No. SW5985
		OHM PROJECT No. 18609	DRAWING No. FIG A-1



LOCATION OF TAA 772 REUSE MAP FIG-2