DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/28/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SA143
Test Name: Various
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 4.5/4.7, 4.9, 5

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
7/30,02/8/1/2/02	8/27/14/02	2, 5, 12

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	/		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	/		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		/	/
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			/
6.5	Were there any transcription /calculation errors?			/

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	/		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		/	
7.3	Are all analyte duplicate results within control limits?	/		
7.4	Were there any transcription /calculation errors?			/

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			/
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			/
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			/

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/28/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SA1143
Test Name: methane
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp: 4.5, 4.7, 4.9, 5, 5.1

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/1/02	8/9/02	8
8/2/02	"	7

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: IC 6/12/02 r 0.987 < 0.990 on the FID pos. → J, r

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: methane MS/MSD SQC 75-125 at 66/74% LCS ok, ~~[illegible]~~ pos → J, m

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes: methane "E" in GW-AA-Q-3-50 prev. flagged for IC failure use result from TCD detector.

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: Mckhadle
Date: Oct 23, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII44

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 5.5°C, 5.3°C, 5.8°C, 5.4°C, 5.2°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
8/5/02	8/11/02	6 days
	8/12/02	7 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: _____

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: _____

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r^2 >0.995? (r > 0.99) Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-). Potential false negatives (use professional judgement) R(-)	[ ]	✓	
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: ICAL
bromomethane 0.987 J+/UJ-
2-hexanone 15.26% RSD J+

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: CCV 8/11@ 0918
chloromethane -21.4%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]	____	____

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: Mitchadle
Date: October 23, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII44

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: All temps were within range

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/5/02	8/8/02	3 days	9/1/02	23 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

CCV 9/1/02 @ 1104 MSG5973
2,6-dinitrotoluene 39.3%
3-nitroaniline 25.8%
2,4-dinitrotoluene 39.9%
4-nitroaniline 30.9%
4,6-dinitro-2-methylphenol 21.0%
dinoseb 22.2%

CCV 9/5/02 @ 2106 MSG5973
bis(2-chloroisopropyl)ether -22.5%
2,4-dinitrophenol 33.4%
4,6-dinitro-2-methylphenol 30.6%
fluoranthene -20.5%
dinoseb 24.2%

no associated sample results

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note: 2,4-dinitrotoluene 130% ↑ / 130% ↑

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: In both field/field dup samples - All ND's

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]	____	____

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: MSShadle
Date: October 23, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA#44

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement?	[✓]		

If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".

Note:

Cooler Temp: All cooler temp were within range.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/5/02	8/8/02	3 days	8/12/02	4 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

CCV 8/12 @ 1755		CCV 8/13 @ 0347	
4,4'-DDE	-21.1% / 15.4%	4,4-DDE	-25.2%
dieldrin	17.6% / 16.4%	methoxychlor	27.2%
endrin	16.9% / 18.7%	α-BHC	/ -18.1%
methoxychlor	21.9%	β-BHC	/ -18.1%
endrin Ketone	18.7%	endrin	/ 15.5%
α-BHC	/ -16.1%	Endosulfan II	/ 16.0%
delta-BHC	/ -16.5%		
Endosulfan II	/ 18.5%		

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

44543-12 DCB 20%/22% - other surrogate ok. no action taken

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]	✓	
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: _____

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: _____

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note: _____

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note: GW-AA-Q-4-50
β-BHC 105.9% J,g

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]	✓	
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: Mishacle
Date: October 23, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII44

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: All temps were within range.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/5/02	8/7/02	~~[illegible]~~ 2 days	8/27/02	20 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]	✓	
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✗]	✓	
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	✗	✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✗]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]	____	____

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: Misshadle
Date: October 23, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII44

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement?	[✓]		

If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".

Note:

Cooler Temp: All temps were within range

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/6/02	8/9/02	4 days	8/13/02	4 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines	✓	[ ]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: dichlorprop 0.11 2,4,5-T 0.18
2,4,5-TP 0.13
Associated samples, results rejected. No action taken

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[✓]	

Note: CCV 8/13 @ 1610
MCPP 17.1%
2,4-DB 18.2% / 20.7%
dinoseb - not included.
No associated samples

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note: _____

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]	✓	
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: _____

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: _____

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✗]	✓	
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]	✗	✓
11.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: _____

12.1.2 Number of target compounds in each analysis: _____

12.1.3 Number of results rejected and/or not reported: _____

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAII44
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: Messhadle
Date: October 23, 2002

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note: All cooler temps were within range.

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note: 8/5/02

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?	✓						✓					

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	Action: R(+/-) J(+)/UJ(-) J(+) R(+)												
	Mercury < 65% 65% - 79% 121% - 135% > 135%												
	Other Metals < 75% 75% - 89% 111% - 125% > 125%												
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.		✓						✓				

Note:

CRDL

Na 76%, ~~67%~~ 78%

Tl 67%

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.												
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓							✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		✓						✓				

Note: ICB - Al 0.02783 Prep Blk: Al 0.01238
Zn 0.00854 Ca 0.01560
Mg 0.00745
Tl -0.00547

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?	✓											
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?												
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)			✓									
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.		✓										

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.		✓						✓				

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.		✓						✓				

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)		✓					✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.		✓						✓				

Note:

MSD - Ca 158% (44%) } *4x spike and
Fe 171% (70%) }

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.		✓						✓				

Note:

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?		✓						✓				
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: _____

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note: _____

DATA VALIDATION WORKSHEET

Dissolved Gases

Reviewer: MSthadle
Date: October 23, 2002
DV Level: II III IV
Review Document:

____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III Modified
____ NFG/CLP ____ other

Project Name: Sauget Area 2
Project Number: 21560888.06004
Laboratory: STL - Savannah
SDG No.: SA II44
Test Name:
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

All cooler temps are within range.

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

8/6/02 8/15/02 10 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes:

Methane r^2: 0.987

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times (3 times and 10 times rule for NJDEP) the blank value are determined for positive and negative blank values. "B" Flags		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Surrogate Recovery

		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			X
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			X
5.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			X

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Was a field blank used for MS/MSD analyses?		✓	
6.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? If yes, there is no action taken on MS/MSD only or professional judgment. For %Rs at 0% with no matrix effect should be J+/R-.	✓		
6.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
6.6	Were there any transcription /calculation errors?		✓	

Notes:

MS|MSD - 66%/69% ↓

7.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits? If Yes, J(+)/UJ(-).		✓	
7.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? If Yes, J(+).		✓	
7.5	Were there any transcription /calculation errors?		✓	

Notes:

8.0 Laboratory Duplicate

		Yes	No	NA
8.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
8.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
8.3	Are all analyte duplicate results within control limits? If No, J(+).			✓
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
9.2	Are all analyte duplicate results within control limits? If no, J+/UJ- or professional judgment.			✓
9.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Are all sample results within the calibrated range?	✓		
10.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
10.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
10.4	Were there any transcription /calculation errors?		✓	

Notes:

11.0 Data Completeness

		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 95%)	✓		
11.1.1	Nunber of samples:			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness =			

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: Mitthadle
Date: October 23, 2002
DV Level: II III IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SA II 44
Test Name:
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: All temps were within control.

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	Date Collected	Date Analyzed	HT
NO_2^-/NO_3^-	8/5/02	8/7/02	2 days
E310	↓	8/14/02	9 days
SO_4^{-2}	↓	8/7/02	2 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?	✓		

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓	✓	
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.		✓	✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:			
10.1.2	Number of target compounds in each analysis:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			↓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			↓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			↓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/8/02
Lab: STL

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA11 45

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 ^{o}C ± 2 ^{o}C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
8/6/02	8/12/02	6

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: TB-0806-KH Styrene 2.4 ug/L
DOS Vig in GW-AA-P-2-104

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995? Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-). Potential false negatives (use professional judgement) R(-)	[ ]	✓	
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: IC 8/1/02
bromomethane corr. coef. 0.987 all ND → UJ, r
2-hexanone RSD 15.3% all ND, no flag

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	judgement.	[✓]		

For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.

Note:

GW-AA-Q-4-100		RL	-100DUP	
Carbondisulfide	2.2	1	2.5	OK✓
Chlorobenzene	7.7	1	6.2	21.6% RPD
benzene	1.0	1	0.18	OK✓

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/8/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA145

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Y/N

Note:

Cooler Temp: 6, 5.8, 5.7, 3.3, 4

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/6/02	8/9/02	3	9/4/02	26
"	"	"	9/5/02	27

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	✓
5.4	verification.		[ ]	✓

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: see attached all ND<50%. no action

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: 3 BNA Diluted out GW-AA-P-2-104 (DF=5) ~~all ND → UJ's~~ ass. compds
3 BNA diluted out in GW-AA-P-2-104 filtered ~~all ND~~ → not used for data assessment

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

		Yes	No	NA
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note:

LCS/LCSD were provided and were acceptable.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: Phenol exceeded calib range → J,q- use diluted results -

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: GW-AA-Q-4-100 — 100-DUP
all ND all ND

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: _____			
14.1.2	Number of target compounds in each analysis: _____			
14.1.3	Number of results rejected and/or not reported: _____			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 10/8/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI45

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 6, 5.7, 5.8, 3.3, 4

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/6/02	8/8/02	2	8/12/02	4

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV[1] only - 5% verification.		[ ]	✓

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note: LCS/LCSD were provided and were acceptable-

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: _____			
14.1.2	Number of target compounds in each analysis: _____			
14.1.3	Number of results rejected and/or not reported: _____			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/8/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA1145

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/6/02	8/7/02	1	8/27/02	20

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: _____

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note: _____

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 8/12/02 1755 both → 4,4-DDE (21.1, 15.4), dieldrin (17.6, 16.4), endrin (18.7, 16.a), primary methoxychlor (21.9), endrin ketone (18.7), conf. alpha-BHC (16.1), delta-BHC (16.5) endosulfan II (18.5) ND's → J,C for 4,4-DDE, dieldrin, endrin
POS. alpha-BHC J,C in GW-AA-P-2-104
8/13/02 0347 see attached

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: Decachlorobiphenyl < 30-150 (26, 28%) in GW-AA-Q-4-110
J, UJ's unless prev.
↓ 28% in GW-AA-P-2-104 no action for one sur. failure-

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note: LCS/LCSD were Provided and were acceptable.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: alpha-BHC in GW-AA-P-2-104, heptachlor in GW-AA-Q-4-110. prev. flagged-

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 10/8/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA1145

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 6, 5.7, 5.8, 3.3, 4

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/6/02	8/9/02	3	8/13/02	4

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines	✓	[ ]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note: MB → Dicamba 0.13 ug/L 2,4,5-TP 0.13 NO POS.
dichloroprop 0.11 2,4,5-T 0.18 no flag

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: CC 5/13/02 1601
2,4-DB 18.2 Primary
4 20.7 Conf.) PDS → UJK in both

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note: LCS/LCSD provided and were ok

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[-]	✓

Note: MCPP (154.6) GW-AA-P-2-104 → J/g

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note: N/A

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]	____	____

12.1.1 Number of samples: _____

12.1.2 Number of target compounds in each analysis: _____

12.1.3 Number of results rejected and/or not reported: _____

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SA1145
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 10/8/02

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note: collected analyzed
8/6/02 8/20, 23/02 ICP
" 8/21/02 Hg

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Action:	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: Initial and Final CRDL Sodium 76, 78
Final thallium 67%. no action

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓								✓			
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓								✓			
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note: MB → pos. al, ca, mg, neg → thallium. al → U, P at RL in some, +1 NDs UJ, P in all ICB, CCBs, al, ca, zinc, mg, copper, mn at low levels, all >5X, no action

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS? Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)												
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note: several analytes present >MDL
sample GW-AA-Q-4-110, ca, Fe > 1/2 ICS A - pos J, n, ND, UJ, n in ass. analytes.

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note:

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: zinc 11% pos → J/s

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?												
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)												
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.												
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: N/A

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/8/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sunset Area 2
Project Number:
Laboratory: STL
SDG No.: SA1145
Test Name: Various
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: collected 8/6/02 analyzed 8/8, 9/14/02

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/8/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget area 2
Project Number:
Laboratory: STL
SDG No.: SA1145
Test Name: Methane
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: collected 8/6/02 analyzed 8/16/02

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: IC 6/12/02 methane 0.987 Pos. J/r in ~~[illegible]~~ - Instrument VMTFID1 any. sample.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			
4.4	Do any field equipment blanks/trip blanks have positive results?			
4.5	Are there field equipment blank/trip blanks associated with every sample?			

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD 66/69 <75-125% LCS ok no action

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes: Methane in GW-AA-P-2-104 prev. flagged due to calib-failure- use -ve-analyseo-

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			/
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			/
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			/
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			/

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/9/02
Lab: STL

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 46

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.4, 3.8, 4.1, 4.2, 3.9, 4.6, 4.8

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
8/7/02	8/11/02	4
"	8/12/02	5

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB → MCl3 at 1.1, 1.2 ug/L and pos → U, Z at RL

TB-0807-KH MCl3 prev U, Z
Styrene 0.62 ug/L no pos, no flag

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: IC 7/11/02 acetone RRF 0.0428

Pos J,r, ND R,r

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 8/11/02 several See attached

Pos. 4-methyl-2-pentanone pos J,C

ND for others <50% or ✓

8/12/02 See attached

all ND

no action

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: 1,1-Dichloroethane MS/MSD 142/144 > 51-140
See LCS

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: 1,1-Dichloroethane 146 > 51-140 all ND no action

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[√]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[√]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[√]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[√]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[√]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[√]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	√

Note: Chlorobenzene exceeded the calib range in several samples and was flagged "E" by the lab → Jeq Samples were -ve-analyzed at diff. dilutions - used diluted results -

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[√]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[√]		
13.3	judgement.	[√]		

For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.

Note:

	GW-AA-Q-5-55	-55 DUP	RPD
acetone	14	25 U	OKV
benzene	0.92	1.1	OKV
chlorobenzene	220	230	4%
total xylene	1.6	1.7	OK ✓
carbon disulfide	1U	0.99	OKV

see attached

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 14

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 13

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 97%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/9/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 46

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.4, 3.8, 4.1, 4.2, 3.9, 4.6, 4.8

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/7/02	8/12/02	5	9/9/02	28
4	4	4	9/14/02	23

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: See attached all ND <50r. no action ✓

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

3 BNA surr. diluted out in GW-AA-Q-5-65DL DF=5

J/UJ, 5 in and. samples.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

0% MS/MSD 3,3-dichlorobenzidine - re-analyzed w/similar results - all ND → R, M

QC 41-121% MS/MSD < QC Acenaphthylene 32%/30, 31, 29%, MSD > QC 12-143 for 4-nitrophenol at 150%. LCS ok, no action ✓

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: 4-Chloroaniline in GW-AA-Q-5-65 → J, q
use Diluted result

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

GW-AA-Q-5-55		RL	55 DUP
2-Chlorophenol	5	10	4.1 OKV
3&4-Methylphenol	1.6	10	10U OKV

GW-AA-Q-5-75		75 DUP
3&4-methylphenol	9.4	9.6 OKV
4-Chloroaniline	130	150 RPD=14%
n-nitrosodiphenylamine	1.1	10U OK

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		

14.1.1 Number of samples: 14

14.1.2 Number of target compounds in each analysis: 66

14.1.3 Number of results rejected and/or not reported: 14

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 98%

Note:

33X2 = 66

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 10/9/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA1146

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.4, 3.8, 4.1, 4.2, 3.9, 4.6, 4.8

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/7/02	8/14/02	7	8/20/02	6

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: CC 8/20/02 1050
primary methoxychlor 17.8 no pos-
decachlorobiphenyl 19.5 QC-) no flags

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: Decachlorobiphenyl < 30 - 150 in GW-AA-Q-5-45 (4%, 5%) J, R, S
GW-AA-P-3-32 (21%, 23%) all ND → UJ, S

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note: LCS/LCSD were provided and were acceptable—

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: beta-BHC, aldrin in GW-AA-Q-5-45 740Y. Prev. due to surr. no more ✓

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[ ]	✓	

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 18

% Completeness = (~~14.1.1 x 14~~.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 71%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/9/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 46

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.4, 3.8, 4.1, 4.2, 3.9, 4.6, 4.8

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/7/02	8/14/02	7	8/28/02	14
			8/27/02	13

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[√]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[√]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[√]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[√]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[√]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[√]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	√
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		√
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	√

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[√]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[√]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[√]	
5.4	verification.		[ ]	√

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[√]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[√]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[√]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[√]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	√

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note:

LCS/LCSD were provided and were acceptable.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: _____			
14.1.2	Number of target compounds in each analysis: _____			
14.1.3	Number of results rejected and/or not reported: _____			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 10/9/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 46

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.4, 3.8, 4.1, 4.2, 3.9, 4.6, 4.8,

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/7/02	8/14/02	7	8/17/02	3

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: CC 8/17/02 0039 primary 2,4-DB 15.2, conf. dalapon 15.5
8/17/02 1154 " " 24%, " " 15.2
No pos. no action

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note: LCS/LCSD were provided and were acceptable.

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: GW-AA-Q-5-45 MCPA (159.6) → J/g

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
11.3	judgement.	[ ]		

For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: _____

12.1.2 Number of target compounds in each analysis: _____

12.1.3 Number of results rejected and/or not reported: _____

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SA1146
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 10/9/02

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note: Collect - analyzed
8/7/02 8/20/02, 8/23/02 ICP
" 8/21/02 Hg
" 8/22/02 Hg

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓				✓		✓			
3.3	Were all dilution reflected in the positive detections and detection limits?		✓					✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	Action: R(+/-) J(+)/UJ(-) J(+) R(+)												
	Mercury < 65% 65% - 79% 121% - 135% > 135%												
	Other Metals < 75% 75% - 89% 111% - 125% > 125%	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?							✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?												
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: Initial, Final CRDL Sodium (76, 78%)
Thallium (67%) no action ✓

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓								✓			
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓								✓			
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note: MB → Pos al, Ca, neg. Tl, Pos. al <5x → U, P at RL. al Ca >5x, Tl NDs → UJ, P in all ✓

ICB, CCB, Pos. al, barium, Ca, copper, Mn, Mg, As, low levels, al >5x, no action ✓

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?	✓											
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓									
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)			–									
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%)												
	Positive: J												
	Non-detect: None												
	30% < %R < 74% (79%)												
	Positive: J												
	Non-detect: UJ												
	%R < 30%												
	Positive: J												
	Non-detect: R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note:

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note:

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?												
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)												
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.												
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: N/A

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: KA
Date: 10/9/02
DV Level: II (III) IV

Project Name: Sauget Area 2
Project Number:
Laboratory: STL
SDG No.: SA1146
Test Name: Methane
Method No.:

Review Document:

✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: collect - 5/7/02 analyzed 8/16/02

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			

Notes: FID 6/12/02 0.987 → J,r

CC FID 23.9% Prev. flagged CC 8/15/02 1135 TCD 110.9% → J,C

K 8/15/02 0945

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD 75-125 at 17%, 12% LCS OK ✓

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			/
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			/
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			/

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes: methane exceeded in GW-AA-Q-5-45, GW-AA-P-2-122 } Prev. Flagged IC failure-
use re-analyses-

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/9/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sunset area 2
Project Number:
Laboratory: STL
SDG No.: 46
Test Name: various
Method No.: –

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: collect – 8/7/02 analyzed 8/9/14/22/02

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			
4.4	Do any field equipment blanks/trip blanks have positive results?			
4.5	Are there field equipment blank/trip blanks associated with every sample?			

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL- Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII47

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 2.6°c - 3.9°c.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
8/8/02	8/12,13/02	4-5 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 8/1/02 1224 I.Cal
MSP5973 8/12/02 1885) field samples, QC
8/13/02 0916

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 2P0812 MB - All NDs

MB - 1P0813 MB - All NDs.

Trip Blank - TB-0808-KH chloromethane 0.19 ug/L. "U, y at RL"
1x5 → 0.95 ug/L

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[·]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 8/1/02 Bromomethane $r^2 = 0.987$. All other %RSDs or r^2 were in control.
RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal. 8/12/02 1936 chloromethane -26.1%, Bromomethane -33.2% — All NDs ok
J.C on TB-0808-KH, 5060-Q-1
All other %Ds were in control., RRF >0.05

8/13/02 1018 Bromomethane -45.0%, chloroethane -24.9%.
Trichloroethene 23.6%, 1,1,2,2-Tetrachloroethane -43.9%
All NDs, ok

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - GW-AA-Q-5-95 Bromomethane MSD=152%. ↑ (40-141%)

MS/MSD - GW-AA-P-3-52 Bromomethane MSD=152%. ↑

Bromomethane was not detected in any of the samples, OK

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 2P0812MB All %Rs were in control

LCS - 1P0813MB All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 12

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

	P-3-42	P-3-42-Dup.
chloromethane	~~0.49~~ 1.0 U,y	~~0.49~~ 1.0 U,y
CS_2	0.57	0.54
CH_2Cl_2	1.0	5.0U.

	P-3-62	P-3-62-Dup
CS_2	0.48	1.0U
Ethylbenzene	0.89	0.90

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII47

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 2.6°C - 3.9°C.

~~GW-AA-Q-5-85 Filtered.~~ JA

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).	✓	[ ]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).	✓	[ ]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

	Date Collected	Date Extracted	HT	Date Analyzed	HT
	8/8/02	8/15/02	7 days	9/8, 12/02	24, 28 days
GW-AA-Q-5-85 Filtered RG	8/8/02	9/13/02	36 days	9/17/02	4 days

~~J/R.~~ JA not use for data interpretation JK

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 8/27/12 1411 (MSZ5973) Ical. & 9/11/12 1630 I. Cal., 9/15/12 1004 I. Cal 9/5/12 1118, 9/6/12 0900, 9/8/12 1146 9/12/12 0944, 9/17/12 1041

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 0815C-BMB Bis(2-ethylhexyl) phthalate 0.93 ug/L → U, z at the RL

MB - 0913C-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal (MSE5-973) 8/27/02 All %RSDs or r^2 were in control.
45670-2DL → 9/11/02 2,4-dinitrophenol r^2=0.9888
45670-3 4,6-dinitro-2-methylphenol r^2=0.9882.
45670-1 9/15/02 Hexachlorocyclopentadiene r^2=0.9880, 2,4-dinitrophenol
45670-11 r^2= 0.9885, Dinoseb r^2=0.9885.
45670-4
45670-4RE

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal. 9/5/02 1137 N-nitroso-di-n-propylamine 21.9%, 3&4-methylphenol 23.7%.
08156-EMB 2,4-dinitrophenol 45.2%, 4,6-dinitro-2-methylphenol 27.6%
3,3'-dichlorobenzidine -22.5%, dinoseb 27.2%
LCS → 9/6/02 0920 2,4-dinitrophenol (52.9%), 4-nitrophenol 21.4%, 4-nitroaniline 26.
4,6-dinitro-2-methylphenol 22.2%, Benzo(g,h,i)perylene -20.6%
Dinoseb 29.6%.
9/8/02 1203 2,4-dinitrophenol 43.7%, Dinoseb 32.0%
⊗ All ND's in associated samples, or

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[✓]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]	✓	

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5 Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification. [ ] ✓

Note: GW-AA-Q-5-95 2-Fluorobiphenyl 32% ↓ (36-124%) only one out, ok.
GW-AA-Q-5-95MS 3 surrogates were out) QC samples, ok
GW-AA-Q-5-95MSD 4 surrogates were out
GW-AA-Q-5-85-Filtered. 2-Fluorophenol 28% ↓ (29-121%), Phenol-d5 22% ↓ (25-128%)
All acid fraction results → J/UJ.
→ re-extracted and re-analyzed. → surrogates were in control, but data were not used for data interpretation.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4 Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification. [ ] ✓

Note: MS/MSD - GW-AA-Q-5-95 — Most of MS/MSD recoveries and RPDs were out may be due to bad extraction - surrogates were low also.

MS/MSD - GW-AA-P-3-52 3,3'-dichlorobenzidine RPD=83%

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 0815C-BMB All %Rs were in control.
LCS - 0913C-MB - LCS/LCSD All %Rs and RPDs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

	P-3-42	P-3-42-Dup	P-3-62	P-3-62-Dup
Bis(2-ethylhexyl)phthalate	1.2	1.3	0.92 ug/L	10.U.
others	NDs	NDs	NDs	NDs

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 14

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII47

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: 2.6°C – 3.9°C.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/8/12	8/14/12	6 days	8/20/12	6 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	~~✓~~ ②
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-0814Q-IMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 8/15/12 All %RSDs or r^2 were in control. (SGIECD)

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: 8/15/02 1025 All %Ds were in control

8/20/02 1027 All %Ds were in control

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal 8/20/02 1050 RTX-CLP Methoxychlor -17.8%, 2,4-DCAA -21.1%, DCBP -19.5%
RTX-CLP2 DCBP -16.5%.
8/20/02 2115 RTX-CLP 2,4-DCAA -21.4%, DCBP -18.6%.
RTX-CLP2 ~~TCMX -15.1%~~, ~~DCBP -15.4%~~ (JA)
≥15%, ok (JA) ≥15% ok

All NDs or surrogates, ok

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

45670-1	GW-AA-P-3-72	DCBP	17%/18%	J/uJ
45670-2	GW-AA-Q-5-85	DCBP	5%/4%.	J/R
45670-13	SEEP-Q-2	TCMX	28%/26%	J/uJ
45670-14	SEEP-Q-1	DCBP	22%/22%	J/uJ

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 08140Q-IMB All %Rs and RPDs were in control

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: _____

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		✓
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: _____

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note; _____

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[ ]	✓	

14.1.1 Number of samples: 5

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 19

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 81.9%

Note: 86/105 =

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII47

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 2.6 - 3.9 °C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/8/02	8/14/02	6 days	8/28/02	14 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 8/23/02 1217 I. Cal

8/28/02 0756. – field samples, QC

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0814G-KUB All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I Cal (MSK5972) 8/23/02 All %RSDs were in control. RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal 8/28/02 0930 } → All %Ds < 20%. RRF >0.05
8/28/02 1921 }

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

See LCS/LCSD

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 08146-KMB All %Rs and RPDs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note: All NDs in associated samples.

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 5

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: TA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII47

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: 2.6 - 3.9 °C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/8/02	8/14/02	6 days	8/17/02	3 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 0814N-SMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 8/9/12 All %RSDs or r^2 were in control.

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal 8/17/12 0039 DB-XLB ~~2,4-DB -15.3%~~ ≈15% OK
DB-35MS Dalapon -15.5%.
8/17/12 1154 DB-XLB 2,4-DB -24.0%
DB-35MS ~~Dalapon -15.2%~~ ≈15% OK
2,4-DB and dalapon were not detected in associated samples, OK

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0814N-SMB All %Rs and RPDs were in control

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 5

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

Project Name: Sauget Area II
Reviewer: JA
Date:

SDG No.: SAII47
Lab: STL Savannah

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note: Cooler temp 2.6 - 3.9 °C

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed.	H.T
ICP	8/8/02	9/6/02	29 days
Hg	8/8/02	8/21/02	13 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%). Action: R(+/-) J(+)/UJ(-) J(+) R(+); Mercury < 65% 65% - 79% 121% - 135% > 135%; Other Metals < 75% 75% - 89% 111% - 125% > 125%	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: CRDL
As initial 76%
Se initial 121%, Final 121%
Tl initial 125%

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).		✓						✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)				✓								
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note: LCS/LCSD All %Rs and RPDs were ok

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.			✓						✓			
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			✓						✓			
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.			✓						✓			
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: See MS/MSD or LCS/LCSD

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%)												
	Positive: J												
	Non-detect: None												
	30% < %R < 74% (79%)												
	Positive: J												
	Non-detect: UJ												
	%R < 30%												
	Positive: J												
	Non-detect: R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD - non-client sample. All %Rs and RPDs were in control.

Post-digestion Spike - ICP SW-AA-P-3-72.) All %Rs were in control.
Hg SW-AA-P-3-72)

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: ICP Serial dilution - SW-AA-P-3-72

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: _____

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 7												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note: _____

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII47
Test Name: Methane
Method No.: SOP AR30.

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 2.6°C - 3.9°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/8/02	8/19/02	11 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 6/12/02 (FID) r^2=0.9867, (TCD) r^2=0.9999 / ok (J, r for FID data).
C. Cal. 8/19/02 0958 (FID) %D<15%, (TCD) %D=20.2%

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: MB - 1C0819MB (FID) ND
1C0819 MB (TCD) ND

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses? (7A)	~~✓~~	✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD GW-AA-P-3-71
Methane MS=61%. ↓ (75-125%)

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 804 = 100% 20.637/20.6 =

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV

Review Document:
- ✓ NFG/SW-846
- ___ NJDEP/SW-846
- ___ NFG/CLP
- ✓ Project QAPP/SAP
- ___ Region III/SW-846

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII47
Test Name: 8O4
Method No.: 375.4

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp: 2.6°C – 3.9°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/8/02	8/22/02	14 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: I Cal 7/23/02 $r^2 = 0.9991$
CCV-5 SO4 = 88% ↓ (90-110%) → S245670-1 J,c other CCVs → OK
17,638/20 =

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 <5.0.
ICB/CCB <5.0.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD - S245797-1
MS = 80%, MSD = 78% (75-125%)
RPD = 1.5%

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSD 100% / 98% / N

~~LCS~~ 0.502/0.50 = 100.4% ✓

0.488/0.50 = 97.6% / N

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: 5670-16 0.016867 / ~~0.016867~~ ~~0.0168~~ (A)

(GW-HA-Q-5-106) 0.016751 ✓

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 3			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV

Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII 47.
Test Name: NO_3-N
Method No.: 353.2

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
– Cooler Temp: 2.6°C – 3.9°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/8/02	8/9/02 – NO_2	1 day
	8/11/02 – NO_3-N	3 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: 8/11/02 r^2=0.9999. (NO_3) 8/9/02 r=0.9996 (NO_2).
ICV/CCVs All %Rs were in control.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND
ICB/CCB NDs.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD - S245547-1
NO_3-N MS=93% , MSD=94%

6.1	Is the LCS/LCSD recovery form present? only LCS	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 106.3% 162.6/153.0 = 106.3% ✓

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: GW-AA-Q-5-106 492.9/492.9 RPD=0%.

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAT27
Test Name: Alkalinity / CO_2
Method No.: 310.1

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 2.6°C – 3.9°C

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/8/02	8/22/02	14 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			✓
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			✓
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND (<1.0)

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only LCS	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?			✓

Notes: LCS - IC0819MB All %Rs

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.		✓	
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/15/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 48

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
8/9/02	8/20/02	11
"	8/19/02	10

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[ ]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[ ]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note: MB → MCB 1.1 ug/L POS <10x → U,Z at RL

TB-0809-KH → Chloromethane 0.83 POS <5x U,Y
MCB 1.2 U,Z

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: IC 8/1/02
bromomethane 0.057 all ND → UJ, r

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: CC 8/19/02
bromomethane 34.3% pred. flagged IC failure –

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/16/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 48

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.1, 1.2, 2

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/9/02	8/15/02	6	9/6/02	22
"	"	6	9/12/02	28
"	"	"	9/5/02	21

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB → bis(2-ethylhexyl)phthalate 0.93 ug/L
DOS < 10 x V.Z at RL

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: IC 8/27/02 2-nitrophenol 15.06 all ND, no flags

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: see attached
~~[illegible]~~ CC 9/6/02 2,4-dinitrophenol 52.9%
NDs → UJ/C
and CC 9/12/02 hexachlorocyclopentadiene -54.5

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[✓]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[✓]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

sur. not recovered SEEP-R-1 DF = 25

4DL DF = 50 no action DF >10

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

		Yes	No	NA
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: %RPD 83%) 72% for 3,3-dichlorobenzidine

MS/MSD ok, no action

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: 4-chloroaniline SEEP_R-1 → J,q
use DF = 50

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: _____			
14.1.2	Number of target compounds in each analysis: _____			
14.1.3	Number of results rejected and/or not reported: _____			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 10/16/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 48

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.1, 1.2, 2

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/9/02	8/14/02	6	8/20/02	6

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: CC 8/20/02 at 1050
primary column methoxychlor -17.8 → J,C
decachlorobiphenyl -19.5 QC - no action

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: Not recovered in SEEP-R-1 DF=2 J/UJ's
~~dec~~ decachlorobiphenyl 24%, 24% < 30-150 in
GW-AA-P-3-112 del ND, UJ's

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note: LCS/LCSD were provided and were good

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: Several compds >40% in SEEP-R-1 prev. flagged due to cir. no more ✓

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[ ]	✓	

Note: bromonitrobenzene (177%) >QC limit in SEEP-R-1 all prev. flagged - no more action -

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/16/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 48

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.1, 1.2, 2

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/9/02	8/14/02	5	8/28/02	14

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note: LCS/LCSD were provided -

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: _____			
14.1.2	Number of target compounds in each analysis: _____			
14.1.3	Number of results rejected and/or not reported: _____			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 10/16/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 46

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.1, 1.2, 2

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/9/02	8/14/02	5	8/17/02	3
"	"	"	9/5/02	22
~~"~~	~~"~~	~~"~~		

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: See attached 214-D → JIC in SEEP-R-1 DL

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[✓]		
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: 2,4-DCAA (155%) 7 27-133 in SEEP-R-1 POS → J/S

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note: LCS/LCSD were provided -

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: dichloroprop, 2,4-D "E" in SEEP-R-1 prev. flagged use DF=25 result

Several >40%. all prev. flagged-

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: _____

12.1.2 Number of target compounds in each analysis: _____

12.1.3 Number of results rejected and/or not reported: _____

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: 48
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 10/16/02

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note: Collect Analyzed
8/9/02 8/20/02, 8/21/22 02, 8/26/27/02 ICP
" 8/26/02 Hg

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?	✓						✓					
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%). Action: R(+/-) J(+)/UJ(-) J(+) R(+) Mercury < 65% 65% - 79% 121% - 135% > 135% Other Metals < 75% 75% - 89% 111% - 125% > 125%	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? ~~Level IV only.~~			✓						✓			

Note: MB → pos, al, barium, copper, thallium, pos < 5x → U.P at RL
ICB, CCB pos, al, cu, thallium,
neg → calcium, magnesium) al (pos > 5x
no flag

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓								✓	✓		
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).		✓							✓			
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?	✓											
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?		✓										
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)												
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.		✓				✓						

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓	✓					✓	✓		

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%)	Positive: J			Non-detect: None								
	30% < %R < 74% (79%)	Positive: J			Non-detect: UJ								
	%R < 30%	Positive: J			Non-detect: R								
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note:

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note:

sodium 114% → J/S

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?												
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)												
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.												
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: N/A

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)												
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note: _____

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/16/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: 48
Test Name: Various
Method No.: Various

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT	
8/9/02	8/10,12/02	1,3	NO3
"	8/16/02	7	SO4
"	8/12/02	3	CO2
"	8/21/02	12	Alk-

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/16/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sunset
Project Number:
Laboratory:
SDG No.: 48
Test Name: methane
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: Collected 8/9/02 analyzed 8/20/02

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: IC 6/12/02 FID R^2 <0.990 at 0.987 → JIC

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS 71% < 75-125%. LCS, MSD OK, no action

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

use result from TCD column

Methane in GW-AA-P-3-112 prev. due to IC

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL- Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII49

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.8°C - 5.9°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
8/12/02	8/21/02	9 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 7/11/02 0857. I. Cal
8/21/02 1003 field samples, QC

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	✓ (TA)
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		✓ (TA)
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-100821MB Methylene chloride 1.7 ug/L → U,2 at the RL

Trip Blank - TB-0812-KH. CH_2Cl_2 - 1.2 ug/L U,2.
Benzene - 0.14 ug/L) → U,y in GW-SA-P-3-122
Styrene 0.47 ug/L.)

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal. 7/11/02 All %RSDs or r^2 were in control.
(MS05973) RRF = 0.0487.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal. 8/21/02 1016 Acetone 30.8% J.C, Methylene chloride 33.3%
1,1-dichloroethane 32.3%, 4-methyl-2-pentanone -20.8%
Tetrachloroethene 21.7%.

All RRF > 0.05

All other results were either flagged due to blank contamination or non-detected
JK

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - GW-AA-P-3-122

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 10Ø821MB. 1,1-Dichloroethane 154% ↑ (51-140%)
Dibromochloromethane 130% ↑ (68-126%)
1,2-dichloroethane 140% ↑ (43-136%).
Since these compounds were not detected in the associated samples, ok

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: TA ~~0~~ 2

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = ~~100%~~ 97% . TA

Note: 97/99

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII49

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.8°C - 5.9°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/12/02	8/15/02	3 days	9/12, 16/02	28, 32 days
8/13/02	8/19/02	6 days	9/11/02	23 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 8/17/02 1411 I. Cal. , 9/11/02 1630 I. Cal. 9/15/02 1004 I. Cal.
9/1/02 1216 , 9/12/02 0944 , 9/16/02 0802

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0815D-3MB All ND's

MB-0819C-3MB All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal (MSE 5973) 8/27/02 All %RSDs or r^2 were in control.
MSE 5973 9/11/02 2,4-dinitrophenol r^2=0.9888, 4,6-dinitro-2-methylphenol r^2=0.988
9/15/02 Hexachlorocyclopentadiene r^2=0.9880, 2,4-dinitrophenol r^2=0.9885
Dinoseb r^2=0.9885

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal 9/1/02 1232 All %Ds <20%, RRF >0.05

45747-1 → 9/12/02 1059 Hexachlorocyclopentadiene (-54.4%) UJ,C 2,4-dinitrophenol -21.5%
45747-2 9/15/02 1117 All %Ds <20%.
→ 9/16/02 0820 4-nitroaniline 25.2%
45747-4

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]	✓	

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

0819C-BMB LCSD All surrogate recoveries were greater than the upper control limit! QC sample, ok

GW-BA-P-1-44 phenol-d5 24% ↓ (25-128%). only one out, ok.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0815D-BMB. All %Rs and RPDs were in control.
LCS/LCSD - 0819C-BMB 4-chloroaniline LCS = 5% ↓ 3-nitroaniline LCS = 0% ↓
3,3'-dichlorobenzidine LCS = 0% ↓, benzo(b)fluoranthene LCS = 150%
Benzo(a)pyrene LCS = 130%, Dibenzo(a,h)anthracene LCS = 160%
Carbazole LCS = 43% ↓
GW-AA-P1-44

10. Internal Standards

Most of LCSD and RPDs were out — may be inad

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[~~✓~~] JA	✓	

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note: 0819C-BMBLCSD All IS peak areas were low
see attached

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 4

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 98.5%

Note: 256 /260 =

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: TA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII49

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement?	[✓]		

If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".

Note:

Cooler Temp: 4.8°C - 5.2°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/12/02	8/14/02	2 days	8/20/02	6 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-0814Q-1MB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: I Cal 8/15/02 All %RSDs or r^2 were in control

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: 8/15/02 1025) All %Bs were in control
8/20/02 1027)

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal (SG1ZCD) 8/20/02 1050 RTX-CLP Methoxychlor -17.8% 2,4-DCAA -21.1%
DCBP -19.5%
RTX-CLP2 DCBP -16.5%

8/20/02 2115 RTX-CLP 2,4-DCAA -17.4%, DCBP -18.6%
RTX-CLP2 ~~TCMX -15.1%~~ ~~DCBP -15.4%~~ JA
JA ≈15% JL ≈15% JL

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS-0814Q-1MB %Rs and RPDs were in control

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[ ]		✓
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note: All VOCs

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: All NDs

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		✓
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 1

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII49

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.8°C – 5.2°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/12/02	8/14/02	2 days	8/27/02	13 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 8/23/12 1217. I Cal

8/27/12 0139 field sample

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0814G-KMB All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I Cal (MSK5972) 8/23/02 All %RSDs < 15%

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal. 8/27/02 0643) All %Ds <20%.
8/27/02 1609

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0814G-KMB All %Rs and RPDs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 1

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII49

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.8°C - 5.2°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/12/02	8/14/02	2 days	8/17/02	3 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 0814N-SMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal. 8/9/02 All %RSDs or r^2 were in control (SGS ECD)

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal 8/17/02 0039 DB-XLB ~~2,4-DB -15.2%~~ ≈15% ok
DB-35MS Dalapon -15.5%

8/17/02 1154 DB-XLB 2,4-DB -24.0%
DB-35MS ~~Dalapon -15.2%~~ ≈15%.

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0814N-SMB All %Rs and RPDs were in control.

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[ ]		✓
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note: All ND

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: All ND in associated sample.

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: only one sample

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 1

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: _____
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: _____
Date: _____

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note: Cooler temp 4.8°C - 5.2°C

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).								✓				

Note:

	Date Collected	Date Analyzed.	H.T
ICP	8/12/02	8/27/02	15 days
Hg	8/12/02	8/26/02	14 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%). Action: R(+/-) / J(+)/UJ(-) / J(+) / R(+) — Mercury: < 65% / 65% - 79% / 121% - 135% / > 135%; Other Metals: < 75% / 75% - 89% / 111% - 125% / > 125%	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: CRDL All %Rs were in control.

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓							✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)				✓								
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.			✓						✓			
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			✓						✓			
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.			✓						✓			
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: See MS/MSD. or LCS/LCSD-

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD - non-client sample - All %Rs and RPDs were in control

Post-digestion Spike - GW-AA-P-3-126 All %Rs were OK

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: Serial dilution - GW-AA-P-3-126 IC = 11.1% (J(+)). ac

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note:

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 2												
12.1.2	Number of target compounds in each analysis: 22												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846
___ NJDEP/SW-846
___ NFG/CLP
✓ Project QAPP/SAP
___ Region III/SW-846

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII47
Test Name: Methane
Method No.: SOP AR30

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp: 4.8°C – 5.2°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/12/02	8/20/02	8 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 6/12/02 r^2 = 0.9866
C. Cal 8/20/02 0921. %D = 10.9% /M

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: MB - IC0820MB ND

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?	✓		
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD - 45918-1 (non-client sample BB-1)
MS = 71% (75-125%.)

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only LCS	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

LCS - LC0820MB. Methane 85% (75-125%)

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV

Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII47
Test Name: Alkalinity / CO_2
Method No.: 310.1

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 4.8°C – 6.2°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/12/02	8/21/02	9 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			✓
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			✓
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND (<1.0)

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

LCSW-1 99%/NR 151.5/153.0

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: GW-AA-P-3-126 521.0/529.1 RPD=1.5

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII47
Test Name: NO_3-N
Method No.: 353.2.

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 4.8°C - 5.2°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed		HT
8/12/02	8/20/02	NO_3	8 days
	8/13/02	NO_2	1 day

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal NO_3 - 8/20/02 $r = 0.9999$, 8/13/02 - NO_3 $r = 0.9996$
ICV/CCV %Rs were in control.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND
ICB/CCB - all NDs.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD - non-client sample.
MS = 99.5%
MSD = 101.5%

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

LCSW-1 109% 0.547/0.5

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: GW-AA-P-3-126 ND/ND

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII47
Test Name: Sulfate
Method No.: 375.4

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 4.8°C – 5.2°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/12/02	8/16/02	4 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: I. Cal. 8/16/02 r = 0.9991.
ICV/CCV All %Rs were in control

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND
ICB/CCB All ND's.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD - S245854-1 (non-client sample)
MS = 97%
MSD = 98% RPD = 0.6%

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

LCSW-1 100% 20.713/20.65

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: Lab dup - S245657-1 6.857/6.727
(non-client sample)

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Level IV Review

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII50

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 3.7°C - 4.4°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
8/14/02	8/23/02	9 days
8/15/02	8/23/02	8 days
⊛ MS/MSD (45875-1)	8/26/02	11 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 8/6/02 0958 I. Cal.
8/23/02 1004 All field samples + MB + LCS
8/26/02 1022 MS/MSDs + MB + LCS

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	~~✓~~ (TB)

Note:

MB - 8/23/02 (1L0823MB) Benzene 0.60 ug/kg, Trichloroethane 0.48 ug/kg, Toluene 0.95 ug/kg, Chlorobenzene 0.90 ug/kg.

MB - 8/26/02 (1L0826MB) 2-butanone 1.2 ug/kg, Toluene 1.6 ug/kg, Styrene 0.21 ug/kg.

Trip Blank - TB-0815-KH, Benzene 0.59 ug/L, Trichloroethane 0.45 ug/L, Toluene 0.96 ug/L, Chlorobenzene 0.88 ug/L) all U.2 due to MB contamination.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: I. Cal 8/6/02 Bromomethane %RSD=52.4%. UJ, r
(MSL5972) All other %RSDs or r^2 were in control.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

C. Cal 8/23/02 1032 chloromethane -51.2% UJ.c/J.c, Bromomethane -63.1%
methylene chloride -20.5% — J, c

8/26/02 1107. chloromethane 22.8%, Acetone -21.9%, 1,1,1-Trichloroethane -21.5%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	≠ (JA)

Note:

Soil-OS-3-6'

Dibromofluoromethane 97%. ✓ $\frac{165385 \times 250}{320322 \times 0.7776 \times 250} = 96.5\%$

Toluene-d8 92%. ✓ $\frac{604449 \times 250}{548321 \times 1.2069 \times 250} = 91.8\%$

p-Bromofluorobenzene 95%. ✓ $\frac{247801 \times 250}{309592 \times 1.8408 \times 250} = 95.1\%$

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	≠ (JA)

Note:

MS/MSD - Soil-OS-3-0.5 Carbon disulfide MSD=138% ↑ (40-135%) Acetone RPD=32% (<28%

MS/MSD - Soil-OS-3-6 Carbon disulfide MS=154% ↑,

12 RPDs were greater than the acceptable limit - see attached.

MS/MSD - Soil-Q-13-0.5FT Chloromethane 171%/152%, Carbon disulfide 171%/141%

Vinyl chloride MS=146%, Bromomethane MS=305%,

Chloroethane MS=146%, 1,1-dichloroethane MS=134%

7 RPDs were greater than the acceptance limit - see attached

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	✓ JA

Note: LCS - 1L0823MB, 1L0826MB) All %Rs were OK

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: Soil-OS-2-0.5/Soil-OS-2-0.5'-DUP. Soil-OS-2-6'/Soil-OS-2-6-DUP Soil-OS-4-6FT/Soil-OS-4-6FT) trace amount of ~~trace~~ target compounds were detected, difference all < 2×RL, ok

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 14

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 50

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 3.7°C - 4.4°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/14/02	8/28/02	14 days	9/13, 16, 17/02	16, 19, 20 days
8/15/02	8/28/02	13 days	9/16, 17/02	19, 20 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/11/02 1630 I. Cal. (MSE5973), 9/15/02 1048 I. Cal (MSG5973). 9/18/02 1121 I. Cal (MS E5973)
9/12/02 0944 - 9/12/02 2341,
9/16/02 1853 - 9/17/02 0804
9/19/02 1813.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB - 0828A-BMB Benzo(a)pyrene 25 ug/kg → 125
Indeno(1,2,3-cd)pyrene 29 ug/kg → 145
Benzo(g,h,i)perylene 31 ug/kg → 155
U.z at the RL.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995? JA	[✓]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: 9/11/02 (MSE5973) 2,4-dinitrophenol r^2=0.9888, 4,6-dinitro-2-methylphenol r^2=0.9882
9/15/02 (MSG5973) All %RSDs or r^2 were in control.
9/18/02 (MSE5973) 2,6-dinitrotoluene 15.43% ≈15% OK.
All other %RSDs or r^2 were in control.

45816-1
UJ,r

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

MS, LCS

Note: 9/12/02 1059 (MSE5973) Hexachlorocyclopentadiene -54.4%, 2,4-dinitrophenol -21.5%
9/13/02 0103 (") 4,6-dinitro-2-methylphenol 30.5% UJ,r
45816-1
9/16/02 1958 (MSG5973) 2-nitroaniline 25.3% — All ND in associated samples, OK
9/17/02 0822 (") 2,4-dinitrophenol 25.9%, Benzo(b)fluoranthene 22.5%, Dinoseb 22.5%
9/19/02 1827 (MSE5973) All %Ds < 20%

All NDs in associated samples OK

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note: Soil-OS-3-6' 2-Fluorobiphenyl 22%.) only one surrogate out, OK.
Soil-OS-3-0.5' 2-Fluorobiphenyl 22%.
Soil-OS-2-0.5'-Dup. 2,4,6-Tribromophenol 22% (acid fraction), Terphenyl-d14 25%
This sample was re-analyzed with acceptable surrogate recoveries.

Soil-OS-3-0.5MS 2,4,6-Tribromophenol 17%, Terphenyl-d14 19%.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note: MS/MSD - Soil-OS-3-0.5' - See attached.

MS/MSD - Soil-OS-3-6' Dimethylphthalate 46%/- ~~N-Nitroso-2-methylph~~ N-Nitrosodiphenylamine 46
Butylbenzylphthalate 40%/48%, Benzo(a)anthracene 48%/-
Chrysene 48%/54%.

MS/MSD - Soil-Q-13-0.5FT See attached

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: LCS - 0828A-3MB 2,4-dimethylphenol 91% ↑ (33-84%)

Since this compound was not detected in the associated samples, OK.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[ ]	✓	

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

		Yes	No	NA
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

		Yes	No	NA
10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

See attached.

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

Soil-OS-2-0.5'/Soil-OS-2-0.5'-Dup. trace amounts in both samples (difference <2xRL) ok

Soil-OS-2-6'/Soil-OS-2-6'-Dup Soil-OS-2-6' Benzo(g,h,i)perylene ~~29 ug/kg~~ 390U,z

All others - NDs

Soil-OS-4-6FT/Soil-OS-4-6FT-Dup. All NDs

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 13

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%.

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 50

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 3.7°C - 4.4°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/14/02	8/28/02	14 days	8/31, 9/11, 9/12	3, 14, 15 days
8/15/02	8/28/02	13 days	8/31, 9/11	3, 14 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?	✓	[ ]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: MB-08280-MMB Endrin Ketone 0.34 ug/kg. Positive results U,z at the RL

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: I. Cal. 8/30/02 (SGMZCD) All %RSDs or r^2 were in control on both columns

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: 8/30/02 1904
8/31/02 0321
9/11/02 1546
9/12/02 1011
All %Bs were in control.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: C. Cal 8/31/02 1438 alpha-BHC -20.7%/—, delta-BHC -18.2%/—, 4,4'-DDD 16.9%/18.8%
4,4'-DDT -33.3%/-29.4%, Endrin aldehyde -35.4%/-26.6%, Methoxychlor -17.3%/-20.9
9/11/02 1609 alpha-BHC -22.6%/—, delta-BHC -20.4%/—, Endrin aldehyde -24.9%/-20.9%
Methoxychlor —/-17.5%, Endrin ketone 16.0%/—
45816-1 9/12/02 1034 alpha-BHC -23.9%/—, gamma-BHC -17.1%/—, delta-BHC -21.8%/—
-2 4,4'-DDT -16.7%/-16.6%, Endrin aldehyde —/-20.8%, Methoxychlor -26.4%/-24.6
45816-5 9/12/02 2052 alpha-BHC -23.0%/—, gamma-BHC -16.0%/—, delta-BHC -20.7%/—
Endrin aldehyde -20.2%/-19.4%, Methoxychlor —/-17.1%.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note: Soil-OS-3-0.5' TCMX 21%/24% ↓ DCBP 358%/374% ↑ J/UJ.
Soil-OS-2-0.5'-Dup. DCBP ↑ on both columns J(+)
Soil-Q-13-6FT TCMX 29%/—) only one surrogate out, ok
Soil-OS-4-6FT TCMX 27%/—
Soil-OS-2-0.5' DCBP ↑ on both columns. J(+).
Soil-OS-3-0.5MS DCBP ↑
Soil-OS-3-0.5MSD DCBP ↑) MS/MSD - QC samples,
Soil-Q-B-0.5FTMS. DCBP — 167%.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note: MS/MSD - Soil - OS-3-0.5' (45816-3) — several MS/MSD %Rs and RPDs out, see attached
MS/MSD - Soil - OS-3-6 (45816-4) 4,4'-DDE RPD=40%, Endrin RPD=45% 4,4'-DDT RPD=46%.
Methoxychlor RPD=85%, Endrin ketone RPD=32%
MS/MSD - Soil - Q-13-0.5FT Endrin aldehyde MSD=144%, gamma-BHC RPD=57%, endrin ketone RPD=32

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: ~~M~~ LCS - 08280-MMB Endrin ketone LCS = 113% (29-112%)
① blank contamination
② all positive ~~blank~~ detections in associated samples were previously flagged due to blank contamination, ok

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note:

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note: Soil-OS-2-0.5'/Soil-OS-2-0.5'-Dup – see next page.
Soil-OS-2-6"/Soil-OS-2-6-Dup. All NDs
Soil-OS-4-6FT/Soil-OS-4-6FT-Dup. Methoxychlor 0.51 ug/kg/ 21 U., Endrin ketone ~~1.3 ug/kg~~/ 4.0 ug/kg 4.0 U, Z.

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

	Soil-OS-2-0.5'	Soil-OS-2-0.5'-Dup.	Difference	RPD	RL
Heptachlor epoxide	2.3	0.77.	1.53		1.9
Endosulfan I	2.1 U.	0.19.	0.19		2.1
4,4'-DDE	16	8.4		62.3%	
Dieldrin	9.6	3.8	5.8 /	86.6%	3.8
44'-DDD	6.6	2.4.	4.2 /		3.8
44'-DDT	46	25		59.2% /	
Endosulfan Sulfate	1.1	3.8U.	1.1		3.8
Methoxychlor	21 U.	2.8	2.8 /		21.

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII50

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 3.7°C - 4.4°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/14/02	8/28/02	14 days	9/5/02	8 days
8/15/02	8/28/02	13 days	9/6/02	9 days.

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 8/23/02 1217 (MSK5972). I. Cal.
8/5/02 0549) field samples, QC.
9/6/02 0572

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB - 0828B-KMB All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I. Cal. 8/23/02 (MSK5972) %RSDs < 15%, RRF > 0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

C. Cal

9/5/02 0721) All %Ds < 30% (OK for Soil samples)
9/5/02 1855)

9/6/02 0642) All %Ds < 30% (
9/6/02 1128)

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

MS/MSD - Soil-OS-3-0.5' Hexachlorobiphenyl 31%/39%↓(40-140%)
Octachlorobiphenyl MS=38%↓ (40-140%)
MS/MSD - Soil-OS-3-6' Hexachlorobiphenyl 36%/39% ↓
MS/MSD- Soil-Q-13-0.5FT Hexachlorobiphenyl MS= 35%↓(40-140%)

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

LCS - 0828B-KMB All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

		Yes	No	NA
10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

		Yes	No	NA
10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:
Soil-OS-2-0.5'/Soil-OS-2-0.5' Dup. — see next page.
Soil-OS-2-6'/Soil-OS-2-6' All NDs.
Soil-OS-4-6FT/Soil-OS-4-6FT-Dup. All NDs.

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]	____	____

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

	Soil-OS-2-0.5	Soil-OS-2-0.5'-Dup.	Difference/RPD	RL
Penta-	12	6.6	5.4 /	8.2
Hexa-	12	8.7	3.3 /	8.2
Hepta-	6.2	2.6	3.6 /	12
Octa-	4.2	1.6	2.6 /	12
Nona-	39	29	29.4%.	
Deca	100	73	31.2% /	

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII50

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 3.7°C - 4.4°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).			[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/14/02	8/21/02	7 days	9/16,17,19/02	26,27,29 days.
8/15/02	8/21/02	6 days	9/17/02	27 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 08210-SMB. All ND's

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: I. Cal. 9/4-5/02 (SGSEED) All %RSDs < 20% on both columns.

5.0 Continuing Calibration

45816-6DL. → 9/19/02 2119 DB-XLB All %Ds < 25%.
DB-35MS 2,4-DB -16.0%. — ND.

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: 9/16/02 2103 All %Ds < 15% on both columns.
9/17/02 0957 DB-XLB Dalapon 16.2%, Dicamba 22.3%, MCPP 18.3%, Dichlorprop 15.6%, PCP 19.2%, 2,4,5-TP 16.7%.
DB-35MS All %Ds < 25%
9/19/02 1830 All %Ds < 15% on both column.

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]	✓	

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

Soil-OS-2-6'-DUP.	2,4'-DCAA	28%/—	↓	(30-189%)	J/UJ
Soil-Q-13-0.5FT.	2,4-DCAA	20%/—	↓		J/UJ.

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

MS/MSD - Soil - OS-3-0.5')
MS/MSD - Soil - OS-3-6') All %Rs and RPDs were in control.
MS/MSD - Soil - Q-13-0.5FT MCPP MS=169% ↑ (10-130%) RPD=64% ↑ (50%)
MCPP ND in associated samples. JK

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

LCS - 08210-SMB All %Rs were in control

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✓]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
11.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note: Soil-OS-2-0.5' / Soil-OS-2-0.5'-Dup. See next page.
Soil-OS-2-6' / Soil-OS-2-6'-Dup. All NDs
Soil-OS-4-6FT / Soil-OS-4-6FT-Dup All NDs

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 13

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

	Soil-05-2-0.5'	Soil-05-2-0.5'-Dup.	Difference	RL
MCPP	6600	2200	4400 / <2xRL	2400
Dichlorprop	59	160	101 <2xRL	120.
PCP	5.1	2.8	2.3 <2xRL / N	20

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAII 50
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note: Cooler temp. 3.7°C - 4.4°C

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T
ICP	8/14,15/12	8/30/02	15,16 days
Hg	8/14,15/12	8/23/12	8,9 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?	✓						✓					
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	Action: R(+/-) J(+)/UJ(-) J(+) R(+)												
	Mercury < 65% 65% - 79% 121% - 135% > 135%												
	Other Metals < 75% 75% - 89% 111% - 125% > 125%												
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.		✓						✓				

Note: CRDL
Pb Final 74%
Se Initial 148%. (J(+).) — Soil 05-2-0.5'
V Initial 121%.

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).		✓						✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		✓						✓				

Note: See attached.

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?		✓										
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)			✓									
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.		✓										

Note: Several Cd results J, in - 45816-3, -7.
45875 -1, -3, -4.

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.		✓						✓				

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.		✓						✓				

Note: MS/MSD RPDs were all in control.

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.) %R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%; Positive: J / J / J; Non-detect: None / UJ / R		✓					✓	✓				
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.		✓						✓				

Note: MS/MSD - Soil-OS-3-0.5' Sb 42%/44%. Pb 51%/40%
MS/MSD - Soil-OS-3-6' Sb 62%/63% K 64%/68%
MS/MSD - Soil-Q-13-0.5FT Sb = 37%/43% → J,m on site Q samples only. Hg 124%/135% J,m
Post-digestion spike %Rs were in control. UJ,m

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.		✓						✓				

Note: ICP Serial dilution - Soil-OS-3-6' V 11.7%D. J

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓						✓					
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)		✓						✓				
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.		✓					✓					
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note:

Soil-OS-2-0.5/Soil-OS-2-0.5-DUP. Cu RPD=110.9% J.f on parent sample only

Soil-OS-2-6/Soil-OS-2-6-DUP All RPD/difference JK

Soil-OS-4-6FT/Soil-OS-4-6FT-DUP All RPD/difference JK

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II III IV
Review Document:
✓ NFG/SW-846
___ NJDEP/SW-846
___ NFG/CLP
✓ Project QAPP/SAP
___ Region III/SW-846

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII 51
Test Name: Ferrious Iron (Fe^{+2})
Method No.: SM 3500-Fe-D

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp: 1.1°C – 1.7°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
6/24/02	6/25/02	1 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			

Notes: I. Cal 6/5/02 r = 1.000.
ICV/CCV All %Rs were in control.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND
ICB/CCB All NDs.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD - GW-AA-O-3-28FT.
MS=101% MSD=104%
RPD=1.7%

$MSD = \frac{1.880 - 0.839}{1.0} = 1.041/1.0 = 104.1\%$

$MS = \frac{1.848 - 0.839}{1.0} = \frac{1.009}{1.0} = 100.9\%$

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 Fe^{+2} = 102% / 2.031/2.0 = 101.5%

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes: See MS/MSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

GW-UAA-2-124FT DF = 5.

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995? Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-). Potential false negatives (use professional judgement) R(-)	[ ]	✓	
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: IC 913102 2-butanone 0.987 → UJ,R in all sample

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: See attached
<50% → NDs, no action

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/31/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: S4

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 3.5, 5, 4.4

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/30/02	9/5/02	4	9/16/02	11

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[✓]		
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

		Yes	No	NA
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: _____			
14.1.2	Number of target compounds in each analysis: _____			
14.1.3	Number of results rejected and/or not reported: _____			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 10/3/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 54

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.5, 3.1, 5

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/30/02	9/5/02	4	9/9/02	4

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: see attached

Endrin Ketone ND → UJ/R

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[ ]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[ ]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[ ]	✓	

Note: Is > QC limit for bromonitrobenzene sample BDRK-0-1 on second column. acceptable on first column. all ND, no action

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 11/4/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 54

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.5, 3.1

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/30/02	9/6/02	6	9/11/02	5

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: _____			
14.1.2	Number of target compounds in each analysis: _____			
14.1.3	Number of results rejected and/or not reported: _____			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 11/4/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 54

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: 4.5, 3.1

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/30/02	9/4/02	4	9/6/02	2

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: CC 9/6/02 1609
Primary dalapon 19.7, dicamba 20.7, pentachlorophenol 17.3, 2,4,5-TP [redacted] 16.2,
2,4,5-T 16.1
Conf. ⇒ 2,4-D 21.1 no pos., no action

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

Note: 2,4-DCAA 16%, 16% < 27-133 on both columns for the MSD sample.
No action required for QC sample-

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: See attached data pon 0% MSD → ~~RMA~~ UJ/m
Others < QC no action since MS/LCS OK ✓

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[ ] ✓		

12.1.1 Number of samples: 1

12.1.2 Number of target compounds in each analysis: Ø

12.1.3 Number of results rejected and/or not reported: Ø

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: 54
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 11/4/02

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note: Collected — Analyzed
5/30/02 — 9/10,11/02 ICP
" — 9/6/02 Hg

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?		✓						✓				

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?												
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Action:

	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note:

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

MB → pos, al, Ca, cu, pos cu <5x → U, P at RL. al, ca >5x, no action.
ICB, CCB pos. al, ba, ca, cu, Mg, Mn. Tl. low level. all >5x, no action

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓								✓			
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).			✓						✓			
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?	✓											
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓									
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)												
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note:

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓					✓	✓			

Note: Sodium 10.8% > QC → J/5

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?												
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)												
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.												
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: N/A

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓			✓			✓			✓		
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/31/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: 54
Test Name: various
Method No.: –

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 4.5, 5, 3.1

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT	
8/30/02	9/1/02	2	NO3
"	9/6/02	6	SO4
"	9/11/02	11	alk.

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MSD 66% < QC 75-125 for SO4 J,m in Sample.

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/3/02
DV Level: II III IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: 54
Test Name: methane
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp: 4.5/5

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
8/30/02	9/6/02	5

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 11/4/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 55

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 5.7, 6

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
9/3/02	9/11/02	8

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		

If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".

3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		

If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[✓]	[illegible]
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		

Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines

4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB → MCl_3 2.4 ug/L 10S < 10X

U,z at RL in the trip blank

Trip blank - $CHCl_3$ 2.3 ug/L → U,z at the RL.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: IC 8/6/02 bromomethane % RSD 28% no action
Chloroethane 0.988
2-hexanone 0.988
1,1,2,2-tetrachloroethane 0.988 } all ND UJ, r

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: CC 9/11/02 0744
1,1,2,2-tetrachloroethane 22.8%
Prev. Flagged

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[√]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[√]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[√]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		√
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[√]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		√
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	√

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[√]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	√	
13.3	judgement.	[ ]		√
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: BORK – Q – 2 DUP
ND ND

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 11/4/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 55

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 5.7, 6

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/3/02	9/5/02	2	9/23/02	18
			9/20/02	15

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: See attached

all ND ; <50%, no action

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

		Yes	No	NA
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: BDRK-Q-2 Dup
all ND all ND

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: _____			
14.1.2	Number of target compounds in each analysis: _____			
14.1.3	Number of results rejected and/or not reported: _____			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 11/4/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 55

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 5.7, 6

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/3/02	9/5/02	2	9/15/02	13

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: see attached
NDs UJ,C for dieldrin, endrin, endosulfan sulfate
and methoxychlor.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: BDRK-Q-2 -DUP
ND ND

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 1/14/07
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 55

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 5.7, 6

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/3/02	9/6/02	3	9/11/02	5

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: _____

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note: _____

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[✓]		
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: BDRK-Q-2 DUP
ND ND

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 1/14/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 55

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 5.7, 6

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]		

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/3/02	9/9/02	6	9/12/02	3

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: CC 9/12/02
dalapon 17.1 primary column
no pos, no flag

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	

Note:

LCS/LCSD provided and were acceptable-

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[ ]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	

Note:

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✓]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]	✓	
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: BDRK-Q-2 DUP
all ND all ND

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[√]		

12.1.1 Number of samples: _____

12.1.2 Number of target compounds in each analysis: _____

12.1.3 Number of results rejected and/or not reported: _____

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: 55
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 11/4/02

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	C ✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note: Collected Analyzed
9/3/02 9/10,11/02 ICP
" 9/9/02 Hg

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?		✓						✓				

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	Action: R(+/-) J(+)/UJ(-) J(+) R(+)												
	Mercury < 65% 65% - 79% 121% - 135% > 135%												
	Other Metals < 75% 75% - 89% 111% - 125% > 125%												
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: _____

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

MB pos, al, Ca, Mg all >5x, no action
ICB, CCB also al, ba, ca, Mg, Tl low levels no action

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.		✓							✓			
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).			✓						✓			
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?	✓											
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS? Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+) Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)			✓									
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.) %R > 125% (120%) 30% < %R < 74% (79%) %R < 30% Positive J J J Non-detect None UJ R		✓					✓					
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD at 7QC 506/531. J/m in both

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: Sodium 20.7% pos → Js in both

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 11/4/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: 55
Test Name: Various
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 5.7, 6

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
9/3/02	9/4/02	1
"	9/6/02	3
"	9/11/02	8

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

	BDRK-Q-2	DUP	
nitrate	0.11	.15	
Cr2	15	15	OK ✓
Alk	440	440	2% RPD
SO4	7.6	7.1	

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 11/4/02
DV Level: II (III) IV

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: 55
Test Name: methane
Method No.:

Review Document:

✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 5.7, 6

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
9/3/02	9/6/02	3

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes: BDRK-Q-2 DUP %RPD
12 14 15%

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII56

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.0°C and 4.3°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).			[✓]	

Note:

Date Collected	Date Analysed	HT
9/5/02	9/9/02	4 days
9/6/02	9/13/02	7 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		

If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".

3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		

If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".

Note: 8/26/02 1575 (MSB 5973) – I. Cal.
9/9/02 1010 TB-090502, BDRK-R-1
9/13/02 0823 TB-090602, BDRK-S-1

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		

Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines

4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	

Note: MB-1B0909MB Methylene chloride 1.0 ug/L. BDRK-R-1 "~~B~~ U2" at the RL.
MB-1B0913MB All NDs

TB-090502 Styrene 0.71 ug/L → ND in associated sample, OK.
TB-090602 Trichloroethene 0.40 ug/L. → ND in associated sample, OK

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 8/26/02 1515 (MSB5973). I. Cal.
9/9/02 1010. TB-090502, BDRK-R-1
9/13/02 0823 TB-090602 BDRK-S-1.

I. Cal 8/26/02. All %RSDs or r^2 were in control All RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	✓	[ ]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal. 9/9/02 1147. Acetone RRF = 0.04091 → J, c
Chloromethane -20.6%, acetone -31.8%, 2-butanone -30.6%
4-methyl-2-pentanone -23.4%, 2-Hexanone -22.0%
1,1,2,2-Tetrachloromethane -22.4%

⊛ Acetone and 2-butanone → J, c All others NDs.
9/13/02 0846 All %Ds < 20%, RRF >0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[✓]		
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - 46375-1 (non-client sample)
All %Rs and RPDs were in control

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS- 1B0904MB. All %Rs were in control.

LCS- 1B0913MB All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: ~~0~~ 1 (TA)

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = ~~100%~~ 99.2% (TA)

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII56

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.0°C, 4.3°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/5/02	9/9/02	4 days	9/22, 24/02	13, 15 days.
9/6/02	9/9/02	3 days	9/22/02	13 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/18/12 1121 I. Cal.
9/22/12 1339 field samples, LCS/LCSD
9/24/12 1046 BDRK-R-1 ML

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-09096-MB ALL ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I Cal. 9/18/12 %RSDs or r^2 were in control. RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal. 9/22/12 1353. All %Ds <20% RRF >0.05

9/24/12 1101 4,6-dinitro-2-methylphenol -21.9%.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[✓]		
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

Note: BDRK-R-1 DL surrogates were diluted out (DF=10) JK.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[~~✓~~]	NA	✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]		✓
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - All %Rs and RPDs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: BDRK-R-1 4-chloroaniline J,q → sample was diluted 10X –

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 2

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII56

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.0°C, 4.3°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/5/02	9/9/02	4 days	9/11/02	2 days
9/6/02	9/9/02	3 days	9/11/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-090090-RMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 8/27/12 All %RSDs or r^2 were in control

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: 8/27/02 1056. 9/11/02 1007) All %Bs were in control

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

9/11/02 1031 alpha-BHC -21.2%/-25.8%, 2,4-DCAA 16.4%/18.2%.
Heptachlor 15.5%/— delta-BHC -20.3%/—

9/11/02 2118 alpha-BHC -20.0%/-24.0%, Heptachlor 20.2%/—
delta-BHC -19.8%/— 2,4-DCAA 19.0%/20.9%.
DCBP —/-16.4%.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

BDRK-S-1 DCBP 28%/28% ↓ (30-150%) UJ.s

BDRK-R-1 TCMX 26%/— DCBP 18%/17%. UJ.s.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: See LCS/LCSD

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 09090-RMBLCS alpha-BHC 34%/38°C ↓ (46-131%)
Heptachlor RPD=41%
Heptachlor epoxide RPD=57%

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note: All NTDs

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns. All NDs	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: _____

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		✓
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: _____

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note: _____

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 2

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: JA ~~4~~ 2

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 95.2%.

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI256

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 4.0°C, 4.3°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/5/02	9/6/02	1 day	9/11/02	5 days
9/6/02	9/13/02	7 day	9/19/02	6 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/9/02 0554 I. Cal.
9/11/02 0538 MB, BDRK-R-1
9/19/02 1248 MB, BDRK-S-1

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:
MB - 0906C-MB NDs
0913E-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I. Cal. 9/9/12 (MSK5972). All %RSDs < 20%.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal. 9/11/12 0641. 9/11/12 1359. → All %Ds < 20%.

9/19/12 1348 2327 All %Ds <20%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - 46259-1 (BDRK-0-1). in SDG: SAI524

All %Rs and RPDs were in control

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 0906C-MBLCS. All %Rs were in control

LCS/LCSD - 0913E-MBLCS All %Rs and RPDs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[ ]		✓
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[ ]		✓

Note: All NDs

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: All NDs

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 2

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAD56

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: 4.0°C, 4.3°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/5/12	9/9/12	4 days	9/16/12	7 days
9/6/12	9/12/12	6 days	9/16/12	4 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-0909N-SMB All NDs.
0912N-SMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal (9/4-5/12) All %RSDs < 20% on both columns
(SGSZED)

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)		[✓]	
5.4	verification.		[ ]	✓

Note: C. Cal. 9/16/12 1126 All %Ds < 15% on both columns
9/16/12 2103 All %Ds < 15% on both columns.

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[ ]	✓	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD -0909N-SMB All %Rs and RPDs were in control.

LCS -0910NSMB Pentachlorophenol 120% ↑ (11-110%) ND in associated sample

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

BDRK-R-1 2,4-D RPD=45.0% J,g

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 2

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAII-56
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note: Cooler temp 4.0°c, 4.3°c

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T
ICP	9/5, 6/02	9/17/02	11, 12 days
Hg	9/5, 6/02	9/13/02	7, 8 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%). Action: R(+/-) J(+)/UJ(-) J(+) R(+) Mercury < 65% 65% - 79% 121% - 135% > 135% Other Metals < 75% 75% - 89% 111% - 125% > 125%	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓					✓				

Note: CRDL
Se initial 134%, Final 132%
Tl initial 72% ↓

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).		✓						✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS? Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+) Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)	✓											
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

LCS/LCSD All %Rs and RPDs were ok

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.			✓						✓			
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			✓						✓			
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.			✓						✓			
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: See LCS/LCSD or MS/MSD

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) — Positive: J; Non-detect: None												
	30% < %R < 74% (79%) — Positive: J; Non-detect: UJ												
	%R < 30% — Positive: J; Non-detect: R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD — non-client sample for ICP. All %Rs and RPDs were OK

MS/MSD - BDRK-S-1 (Hg) All %Rs and RPD were OK

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: ICP Serial dilution BDRK-R-1 K %D = 14%

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: _____

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note: _____

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII56
Test Name: Methane
Method No.: SOP AR30

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?		✓	
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 4.0°C and 4.3°C

3 40 ml vial broken for sample BDRK-S-1. No Data were reported
This sample was re-collected See other SDG. ok

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
9/5/02	9/19/02	14 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculationerrors noted in the calibration verificationdata? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 8/30/02 (VMTFID). $r^2 = 0.9906617$ / nc
C. Cal. 9/19/02 0851. Methane 22.7% → J.C

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: MB - 1C0919MB ND

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD - BDRK-R-1 All %Rs and RPDs were in control

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

LCS - IC0919MB. Methane 97% (75-125%)
/pc

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

See MS/MSD.

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:			
10.1.2	Number of target compounds in each analysis:			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAI56
Test Name: Alkalinity / CO2
Method No.: 310.1

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 4.0°C, 4.3°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
9/5,6/02.	9/11,12/02	6, 11 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			✓
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			✓
2.5	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 (9/11/02) → ANNDS
PBW-2 (9/17/02)

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 (9/11/02) 105.5% 161.4/153.0

LCSW-2 (9/17/02) 102.7% 157.1/153.0

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: BDRK-S-1 510.0/510.0 RPD=0.0%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

BDRK-S-1 DF=5

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:			
10.1.2	Number of target compounds in each analysis:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII 56
Test Name: Nitrate
Method No.: 353.2.

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp: 4.0°C, 4.3°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
9/5/02	9/6/02	1 day
9/6/02	9/8/02	2 day

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculationerrors noted in the calibration verificationdata? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: Nitrate 9/6/02 r=0.9999. 9/9/02 r=0.9999 (8/30/02 Nitrite 0.9996
ICV/CCV All %Rs were in control. (9/6/02 Nitrite 0.9996

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?	✓		✓

Notes: PBW-1 ND PBW-2 ND.
ICB/CCB All NDs.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD - 246352-6 (non-client sample) - Nitrate
All %Rs and RPDs were ok
MS/MSD - BDRK-S-1 - Nitrate MS=97% ok, MSD=97% ok RPD=0.52%.

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 (9/6/02) 117%. 0.584/0.5

LCSW-2 (9/9/02) 101% 0.503/0.5

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes: Lab dup Nitrate 246336-41 (non-client sample) 0.056/0.055 RPD=2.5%

246427-2 (non-client sample) 0.696/0.689 RPD=1.0%.

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:			
10.1.2	Number of target compounds in each analysis:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: TA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAI56
Test Name: SO4
Method No.: 375.4

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp: 4.0°C, 4.3°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
9/5/02	9/16/02	11 days
9/6/02	9/23/02	17 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculationerrors noted in the calibrationverificationdata? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 7/23/02 $r^2 = 0.9991$
ICV/CCV All %Rs were in control.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 (9/16) ND ICB/CCB All NDs
PBW-1 (9/23) ND

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD - 246357-1 (9/16/02, non-client sample) 114%/115% RPD=0.052%

MS/MSD - 246638-1 (9/23/02, non-client sample) 48%/46% ↓ RPD=8.3%
↳ non-client sample, no action was taken.

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 (9/16/02) 99%
LCSW-1 (9/23/02) 98%

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: Lab dup 246358-1 (9/16/02). -- non-client sample ND/ND.
Lab dup 246721-7 (9/23/02) - non-client sample 653.0/189.14 RPD=5.4%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:			
10.1.2	Number of target compounds in each analysis:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: _____
Date: _____
Lab: __STL Savannah_____

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: _____

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.7 - 2.5 °C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 ^{o}C ± 2 ^{o}C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
9/9, 10/02.	9/13/02	3, 4 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 8/26/02 1515 I. Cal.
9/13/02 0823 field samples, QC

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:
MB - 1B0913MB. All NDS.
TB-090902 Styrene 0.28 ug/L → ND in associated samples
D-91002 Styrene 0.77 ug/L. → ND in associated samples.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

I. Cal. 8/26/02 (MSB5973) All %RSDs or r^2 were in control
RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal. 9/13/02 0846. All %Ds < 20%.
RRF >0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - Leach - R - 1

Chloroethane MS = 32%, MSD = 22%

RPD = 37%

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 130913 MB All %Rs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 5

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 57

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.7 - 2.5°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).	✓	[ ]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).	✓	[ ]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

	Date Collected	Date Extracted	HT	Date Analyzed	HT
	9/9,10/02	9/11/02	1,2 days	9/24,26/02	13,15 days.
BORE-P-IRE	9/9/02	9/30/02	21 → R,h	10/2/02	2 days.

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/18/02 1121 (MSE 5973). I. Cal. , 9/21/02 1101 (MSG 5973) I. Cal.
9/24/02 1046) 10/2/02 0733 BDRIC-P-1RB.
9/25/02 2105) field samples 10/3/02 0610. — MS/MSD
9/26/02 0958)

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB - 0911B-MB Di-n-butylphthalate 2.9 ug/L → All NDs in associated samples
0930E-MB All NDs.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I Cal
9/18/02 (MSE5973) All %RSDs or r^2 were in control.
9/21/02 (MSG5973). All %RSDs or r^2 were in control.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:
9/24/02 1101 4,6-dinitro-2-methylphenol -21.9%
9/25/02 2151 3-nitroaniline -21.5%
9/26/02 1012 3-nitroaniline -20.8%, 4,6-dinitro-2-methylphenol -21.2%
10/2/02 0747 bis(2-chloroisopropyl)ether -27.4%, 4-nitro ~~aniline~~ phenol (JA) -22.0%
10/3/02 0627 bis(2-chloroisopropyl)ether -28.7%, 3,3'-dichlorobenzidine -25.0%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form.?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[✓]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

BDRK-P-1 Terphenyl-d14 4% ↓ (14-148%)

Leach-R-1 / Leach-R-1-DL DF=200 / DF=1000. → surrogates were diluted out.
Leach-R-1 MS/MSD DF=1000, surrogate was diluted out.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD - Leach-R-1 All %Rs were 0% — diluted out ~~1000~~ DF=1000

JA

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS - 0911B-MB All %Rs and RPDs were in control.

0930Z-MB All %Rs and RPDs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓] TA	✓	

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: ~~8~~ 42

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = ~~100%~~ 78.1% TA

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAE57

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: 1.7°C - 2.5°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/9.10/02	9/11/02	1,2 days	9/13/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0911N-MMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

I. Cal 8130/12 (SGMZED) All %RSDs or r^2 were in control on both columns

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note:

8/30/02 1902) All %Bs were in control.

9/13/02 0910)

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal.

9/13/02 0934 alpha-BHC -24.0%/-, gamma-BHC -17.2%/-, delta-BHC -22.5%/-
Aldrin -15.5%/-, 4,4'-DDD 16.4%/16.0%, 4,4'-DDT -17.5%/-22.2%
Endrin aldehyde -15.4%/-21.3%, Methoxychlor -19.7%/-20.5%.

9/13/02 1639 alpha-BHC -24.6%/-, gamma-BHC -17.4%/- delta-BHC -22.5%/-
4,4'-DDD 16.6%/16.0%, 4,4'-DDT -19.1%/-20.5%,
Methoxychlor -/-17.4%, Endrin Ketone 16.6%/-

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: BDRK-P-1 DCBP 13%/11%.) J/UJ.
BDRK-Q-1 DCBP 28%/26%.)
Leach-R-1 DF=400. All surrogates were diluted out, JR
Leach-R-1 MS) DF=400
Leach-R-1 MSD.)

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]	✓	
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - Leach-R-1 → MS/MSD were analyzed at a dilution of 400. Spiking compounds were diluted out, ok summary form was not provided

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0911N-MMB. All %Rs and RPDs were in control

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		✓
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII57

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.7 - 2.5°C.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/9, 10/12	9/13/12	3, 4 days	9/30, 10/1	17, 18 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/30/02 1508 I. Cal.; field samples, QC

10/1/02 0739. field sample

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-09136-MB All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	✓ (TA)
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I. Cal 9/30/12 (MSK.1972) All %RSDs <20%.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal.

10/1/02 0102 All %Ds <20%

0846 All %Ds <20%

10/1/02 1346. All %Ds <20%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

Leach-R-1 DF = 10 surrogates were diluted out
Leach-R-1 MS) DF = 10
Leach-R-1 MSD)

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD - Leach-R-1 Spiking compounds were diluted out,
DF = 10.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD. -09137-MB. All %Rs and RPDs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAT257

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.7 – 2.5 °C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/9, 10/02	9/12/02	2, 3 days	9/13/02	1 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB- 0912N-SMB All ND's

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I Cal. 9/4/12 (SGSZCD) All %RSDs < 20% on both columns

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)		[✓]	
5.4	verification.		[ ]	✓

Note: C. Cal.
9/13/12 1200 All %Ds < 15% on both columns.
2227 All %Ds < 15% on both columns.

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[✓]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: Leach-R-1 DF = 1000 surrogates were diluted out
Leach-R-1 MS MSD) DF = 10000

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]	✓	
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - Leach-R-1 spiking compounds were diluted out.

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[ ]	✓	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 0912N-SMB PCP 120% ↑ (11-110%)
↳ All NDs in associated samples, ok

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 3

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAT 57
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note: Cooler temp 1.7°C - 2.5°C

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed.	H.T
ICP	9/9, 10/02	9/25/02	15, 16 days
Hg	9/9, 10/02	9/13/02	3, 4 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	Action: R(+/-) J(+)/UJ(-) J(+) R(+)												
	Mercury < 65% 65% - 79% 121% - 135% > 135%												
	Other Metals < 75% 75% - 89% 111% - 125% > 125%												
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: CRDL
Al final 124%
As final 121%
Fe final 129%
→ Pb final 148% ↑
Na initial 70%.
As initial 64%, final 66%

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓							✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note: _____

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)												
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note: _____

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note: _____

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.			✓						✓			
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			✓						✓			
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.			✓						✓			
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: MS/MSD - Leach-R-1 Hg RPD = -3.16% J, Kl

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)		✓					✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD - Leach-R-1 Al MS = 138% ↑. J.m. — on Leach-R-1 only.

Post-digestion Spike Leach-R-1, BDRK-P-1. All %Rs were in control.

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note:

ICP - BDRK-P-1, Leach-R-1

Hg BDRK-P-1, Leach-R-1

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note:

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 3												
12.1.2	Number of target compounds in each analysis: 23												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SATL57
Test Name: Methane.
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp: 1.7°C - 2.5°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
~~9/9/10/02~~		
9/9/12	9/12/12	3 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculationerrors noted in the calibrationverificationdata? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 8/30/12 $r^2 = 0.9907$ ✓ VK
C. Cal 9/20/12 VBS2 %D = 24.3% J(+)

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: MB- 1C0912MB All ND's

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD- BDRK-S-1 All %Rs and RPDs were in control

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes: LCS - 1C0912 MB %R = 512% (75-125)

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 3			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII5-7
Test Name: Alkalinity / CO2
Method No.: 310.1

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 1.7°C - 2.5°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
9/9/02	9/17/02	8 days

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

LCSW-1 102.7% /NL 157.1/153.0.

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: Lab dup 246399-1 570.0/570.0 RPD=0 %

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			✓
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			✓
2.5	Were any transcription/calculationerrors noted in the calibrationverificationdata? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 N/D

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:			
10.1.2	Number of target compounds in each analysis:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAT57
Test Name: Nitrate
Method No.: 353.2

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 1.7°C – 2.5°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
9/9/02	9/10/02	1 day

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculationerrors noted in the calibration verificationdata? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 9/9/02 Nitrate r=0.9999 Nitrite r=0.9996
ICV/CCV All %Rs were in control

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND
ICB/CCB All ND's

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 107 % 0.503/0.50

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: Lab dup BDRK-Q-1 0.696/0.689 RPD=1.0%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?	✓		

Notes:

BDRK-P-1 in raw data - 0.140 mg/L
on form I 0.096 mg/L check with lab

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 2			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII57
Test Name: SO4
Method No.: 375.4

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp: 1.7°C - 2.5°C

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

Date Collected	Date Analyzed	HT
9/9/12	9/23/12	+4 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculationerrors noted in the calibration verificationdata? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 7/23/12 $r^2 = 0.9991$.
ICV/CCV All %Rs were in control.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND
ICB/CCBs All NDs

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 98% 20.246/20.60

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes: Lab dup 246721-7 653.0/689.1 RPD=5.4%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 2			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII88

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.7, 2.0, 2.3 °C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
9/11/02	9/19, 20/02	8, 9 days
9/10/02	9/22/02	12 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		

If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".

3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		

If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".

Note: 9/3/02 0405 I. Cal. (MSP5973)
9/19/02 0639.
9/20/02 0851) field sample, QC, dilution
9/22/02 1520.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]	✓	

Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines

4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-1P0919MB chloromethane 0.46 ug/L — TB-091102 U,z at the RL
MB-1P0920MB All ND's
MB-1P0922MB chloromethane 0.70 ug/L — Leach-Q-1

TB-091102 chloromethane ~~0.40 ug/L~~ 1.0 U,z , styrene 0.78 ug/L ↳ ND in associated samples. OK

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).	(J)		
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

I.Cal. 9/3/02 (MSPS973). 2-butanone r^2=0.987
All other %RSDs or r^2 were in control.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

9/19/02 0730 Bromomethane -52.3%, 1.2-dichloroethane 35.7% B, Bromodichloromethane 24.1%.
9/20/02 0917 chloromethane 48.9%, Bromomethane -54.2% 1.1.1-TCA 31.8%. 1.2-DCA 42.0% Bromodichloromethane 34.4%, trans-1.3-dichloropropene 21.3%
9/22/02 1517 Bromomethane -61.6%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD - Leach-0-1.

Benzene	52% / 52%	↓	(62-135%)
Chlorobenzene	0% / 0%	↓	(72-127%) → J, m
Ethylbenzene	68% / 72%	↓	(74-122%)
Xylenes	47% / 53%	↓	(73-135%)

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - IP0919MB chloromethane 147% ↑ (34-145%), 1.1.1-Trichloroethane 136% ↑ (69-120%), 1.2-dichloroethane 146% ↑ (65-131%) Bromodichloromethane 134% ↑ (65-125%)
LCS - IP0920MB ~~1.1.1 TEE~~ 1.1.1-TCA 132%, 1.2-DCA 142%, Bromodichloromethane 134%.
LCS - IP0922MB All %Rs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: Leach-Q-1 / Leach-Q-1-Dup.

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

	Leach-Q-1	Leach-Q-1-Dup.
Acetone	1400	1400.
CS_2	>20u	33. ✓ u
CH_2Cl_2	50	44.
Chloroform	53	53
1,1,1-TCA	14	>20u. ✓ u
Benzene	420	430.
1,2-DCA	2200	2100.
TCE	18	22.
MIBK	760	740
Toluene	920	930.
PCE	78	87.
CB	1100	1200
EB	31	34
1,2-DCE	11	<40u. ✓ u
Xylenes	>90	320.

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII58

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.7, 2.0, 2.3 °C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/11/02	9/16/02	5 days	9/26/02	10 days
9/10/02	9/16/02	6 days	9/26/02	10 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/18/02 1121 (MSZ 5973). I. Cal.
9/24/02 1046 – QC
9/25/02 2105 field samples
9/26/02 0958 – dilutions

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0916A-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 9/18/02 (MSE5973). All %RSDs or r^2 were in control

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal.
9/24/02 1101 4,6-dinitro-2-methylphenol -21.9%
9/25/02 2151 3-nitroaniline -21.5%.
9/26/02 1012 3-nitroaniline -20.8%, 4,6-dinitro-2-methylphenol -21.2%

① All ND's in associated samples, ok.
② %D's < 50%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

Leach-Q-1 DF = 200
Leach-Q-1-Dup DF = ~~1000~~ 200 (JA) surrogates were diluted out, ok
Leach-O-1 DF = ~~200~~ 25 (JA)
Leach-Q-1 DL DF = 1000
Leach-Q-1Dup-DL DF = 1000
Leach-O-1 DL DF = 100

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]		✓
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD were not designated on the COC

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0916A-MB. All %Rs and RPDs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: PCP conc in Leach-Q-1
2,4-dichlorophenol in Leach-Q-1, Leach-Q-1-Dup.) J, g.

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: Leach-Q-1 / Leach-Q-1-Dup.

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

	Leach-Q-1	Leach-Q-1-Dup.
phenol	8000	8100.
2-chlorophenol	7700	8100.
1,2-dichlorobenzene	270	290.
3,4-Methylphenol	1600	1600.
Nitrobenzene	1200	1400.
2,4-di~~nitro~~methylphenol	>2000 u	240
2,4-dichlorophenol	170000	170000.
Naphthalene	1200	1200.
4-chloro aniline	8600	10000
2,4,6-Trichlorophenol	12000	13000
2-nitro aniline	15000	16000.
4-nitroaniline	940	1200
PCP	3300	3400.

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAD58

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: 7.7 °C, 2.0 °C, 2.3 °C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/10, 11/02	9/17/02	6.7 days	9/19/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-917N-RMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal. 9/16-17/02 (SGRZCP) All %RSDs or r^2 were in control on both columns.

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: 9/16/12 1330) All %Bs were in control.
9/19/12 0953

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal. 9/19/02 1015 All %Ds < 15% on both columns

9/19/02 1628 Methoxychlor 28.0%/36.3%, Endrin Ketone 19.6%/17.5%
PCBP 20.3%/20.6%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: Surrogates were diluted out

Leach-Q-1 DF=50
Leach-Q-1-Dup DF=50
Leach-O-1 DF=25

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0917N-RMB All %Rs and RPDs were in control

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note:

	Leach-Q-1	Leach-Q-1-Dup	RPD/Difference	RL
beta-BHC	13	14		2.5
Endrin ketone	3.6	2.8	0.8 ug/L	5.0

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII58

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.7, 2.0, 2.3 °C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/10/02	9/13/02	3 days	10/1/02	18 days
9/11/02	9/13/02	2 days	10/1/02	18 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/30/02 1508 ICal., QC

10/1/02 0739 field samples

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0913E-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I Cal 9/30/02 All %RSDs <20%

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal 10/1/02 0102 All %Ds <20%
10/1/02 0846) All %Ds <20%
1346.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - Leach-R-1 (in SDG: SAIIS-7).

① ~~sp~~ sample conc's in parent sample were greater than 4X ~~blank~~ spiking conc.

② sample was analyzed at a 10X dilution, spiking compounds were diluted out.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0913E-MB All %Rs and RPDs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

	Leach-Q-1	Leach-Q-1-Dup.	Difference	RL
Mono -	0.36	0.18	0.18 ✓	0.1
Di -	0.29	0.091	0.20 ✓	0.1
Tri -	0.17	0.026	0.144 ✓	0.1
Tetra -	0.37	0.20U	0.37 ✓	0.20
Penta -	0.24	0.20U	0.24 ✓	0.20
Hexa -	0.08	0.20U	0.08 ✓	0.20

Difference < 2XRL

NL

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI 58

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: 1.7°C, 2.0°C, 2.3°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/10,11/12	9/13/12	2,3 days	9/24,25/12	11,12 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines	✓	[ ]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 0913N-SMB 2,4-D 0.33 ug/L. $\xrightarrow{vs}$ 1.65 ug/L $\xrightarrow{\times 20000}$ 33000. $\xrightarrow{\times 100}$ 165

All 2,4-D results in associated samples > action level, up

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal. 9/4-5/02 (SGSGCD). All %RSDs <20% on both columns

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: C. Cal 9/18/02 1403 Dicamba —/18.0%, MCPA -24.3%/-42.0%, 2,4-DB —/-16.3%.
9/18/02 1730. All %Ds < 15% on both columns.
9/24/02 1505 (DB-XLB) Dalapon 20.5%, Dicamba 16.3%, 2,4-D 17.4%,
Leach-O-1 → PCP 17.7% 2,4,5-TP 16.0%, (DB-35MS) 2,4-DB -16.1%,
9/24/02 2021 All %Ds <15% on both columns.

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[✓]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: Leach-Q-1 DF = 20000 Surrogates were diluted out.
Leach-Q-1-Dup DF = 20000
Leach-O-1 DF = 100

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD were not designated on the COC

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - All %Rs and RPDs were in control.

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✓]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note:

	Leach-Q-1	Leach-Q-1-Dup.
2,4-D	93000	100000
PCP	4400	4800
others	NDs	NDs

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 3

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAII 58
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note: Cooler temp 2.0°C, 1.7°C, 2.3°C

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T.
ICP	9/10, 11/02	9/21/02	10, 11 days
Hg	9/10, 11/02	9/18/02	7, 8 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓					✓				

Action:

	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: CRDL
As initial 136%, Final 126%. Hg 121%.
Se Final 126%
Tl final 122%
Se Final 75%
Na initial 77%, final 65%.

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓					

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓						✓					
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓							✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes; Spiked analytes (ICS AB analytes)												
	< -IDL: UJ(-); > IDL: J(+); < 50%: R(+/-); 50% - 79%: J(+)/UJ(-); > 120%: J(+)												
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury).		✓						✓				
	Action: Aqueous/Soil												
	< 50%: R(+/-); 50% - LCL%: J(+)/UJ(-); > UCL%: J(+)												
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓						✓					
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)		✓						✓				
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓						✓					
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: Leach-Q-1 / Leach-Q-1-Dup All RPDs or differences were in control.

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 3												
12.1.2	Number of target compounds in each analysis: 23												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI59

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: information not provided.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
9/18/02	9/26/02	8 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/4/02 0917 (MS05973). I. Cal.

9/26/02 0938 - QC, field samples

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		~~✓~~
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	~~✓~~

Note:

MB - 100926MB All NDs.

TB - 9-18-02 All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 9/4/02 (MS05973) All %RSDs or r^2 were in control

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	✓	[ ]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal. 9/26/02 1018

1,1,1-Trichloroethane 20.9%.
1,2-Dichloroethane 23.8%.

Acetone RRF = 0.03484 (use linear curves)
J/R

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - 46816A-3 (non-client sample)
All %Rs and RPDs were in control.
⊗ only five spiking compounds were reported (CLP-like).

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 10ppb MB 1,1,1-Trichloroethane 126% ↑ (69-120%).

This compound was not detected in associated sample, OK.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 1

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 99.2%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAT59

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[ ]		✓

Note:

Cooler Temp: information not provided.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/18/02	9/20/02	2 day	9/26/02	6 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 9/18/02 1121 I. Cal

9/24/02 1046. QC

9/25/02 2105 field samples.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB - 8920e-MB All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I Cal. 9/18/02 (MSE5973). All %RSDs or r^2 were in control.

RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal. 9/24/02 1101 4,6-dinitro-2-methylphenol -21.9%.

9/25/02 2151 3-nitroaniline -21.5%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]		✓
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

No MS/MSD samples were designed on the COC

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 0920e-MB All %Rs and RPDs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note: Storm-R-1

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI259

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[ ]		✓

Note:

Cooler Temp: information not provided

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/18/02	9/20/02	2 days	9/23/02	3 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB - 0920N-MMB All NDS

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

9/9/02 (SGMGCD) All %RSDs or r^2 were in control. on both columns.

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note:

8/30/02 1902

9/23/02 0924

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

9/23/02 v948 alpha-BHC -23.6%/— , gamma-BHC -17.8%/—
Aldrin -23.7%/— , Methoxychlor -42.1%/-30.7%

2016 alpha-BHC -22.4%/— delta-BHC -19.8%/— , Methoxychlor -22.2%/-17.7%
Endrin Ketone 17.1%/— , surrogate 2,4-DCAA 23.5%/20.4%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

Storm-Q-1 DCBP 28%/22% ↓ (30-150%) J/UJ

Storm-Q-2 DCBP 9%/9% ↓ J/R.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: No MS/MSD designated on the COC: - See LCS/LCSD.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD. Methoxychlor LCS = 48% ✓ (60-155%). LCSD = 60% OK, but at low end, UJ, instead of R.

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: Several compounds RPD >40% J/g

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		✓
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[ ]	✓	

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 15

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 76.2%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI59

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[ ]		✓

Note:

Cooler Temp: information was not provided.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/18/02	9/25/02	7 days	10/7,8/02	12,13 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:
10/7/02 0827 I. Cal.
10/7/02 1536 Q-1, Q-2, QC
10/8/02 0555 R-1.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:
MB - 0925D-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I-Cal 10/7/02 (MSKS972) All %RSDs <20%

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

10/7/02 1722, 2328) All %Ds <20%

10/8/02 0700, 1714) All %Ds <20%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]		✓
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

No MS/MSD designated on the COC.

One-batch MS/MSD data were provided. (non-client sample)

All %RS and RPDs were in control.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS - 0925D-MB. All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII-9

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[ ]		✓

Note:
Cooler Temp: information was not provided in the data package

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
9/18/02	9/23/02	5 days	9/25/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-0923N-SMB. All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I Cal 9/4-5/02 (SGSECD). All %RSDs < 20%

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: C. Cal 9/25/02 1056. 2,4-DB —/-23.0%
1849 2,4-DB —/-25.2%) J.C.

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

No MS/MSD designated on the COC

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

NDs in associated samples ok

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[ ]	✓	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS/LCSD - 0923N-SMB (24-D LCSD = 180% ↑ (11-154%)

Pentachlorophenol LCSD = 125% ↑ (11-110%)

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note: _____

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: _____

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: _____

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 3

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAQS9
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)		✓						✓				
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T.
Icp	9/18/02	10/1/02	13 days
Hg	9/18/02	9/24/02	6 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: CRDL
Al final 131% ↑
As final 58% ↓
Pb initial 74%, final 64%.

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓					

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓						✓	≠	7A			
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)												
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.			✓						✓			
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			✓						✓			
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.			✓						✓			
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: See MS/MSD

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD — non-client sample. All %Rs and RPDs were in control

Post-digestion Spike - Storm-Q-1 All %Rs were in control.

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: Serial Dilution - Storm-Q-1

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note:

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 3												
12.1.2	Number of target compounds in each analysis: 23												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII60

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: information was not provided - check with lab.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
10/3/02	10/8/02	5 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 10/2/02 1153 (MSP5973) ICal.
10/8/02 0845

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-1P1008MB. All ND's.

U, y at the RL — U, y at the RL

Trip blank - TB - 1,1-Dichloroethene 0.70 ug/L, Benzene 0.43 ug/L, U, y
Trichloroethene 0.44 ug/L, Toluene 0.54 ug/L
Chlorobenzene 0.34 ug/L, Ethylbenzene 0.11 ug/L
Styrene 0.73 ug/L

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

I. Cal 10/2/02 (MSP5973) ~~Bromofr~~ JA, Bromomethane 32.646% RSD.
→ $\overline{RRF}$ > 0.05, but
RRF10 = 0.0397
RRF50 = 0.0418 Since $\overline{RRF}$ > 0.05, OK
RRF200 = 0.0441

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal 10/8/02 0923 Bromomethane 29.4%.
Chloroethane -21.0%.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[✓]		
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

One MS/MSD - non-client sample (47145-3).
All %Rs and RPDs were in control.
only five spiking compounds, (c1 p-bi/a)

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS - 1P100f MB. bromomethane 160% ↑ (40-141%).
Since bromomethane was not detected in the associated samples, OK

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII60

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: information were not provided, check with lab

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
10/3/12	10/7/12	4 days	10/18/12	11 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 10/15/02 0743 (MSG5973). I. Cal.

10/18/02 0934. field samples, LCS/LCSD, MB

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-1007D-MB. All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 10/15/02 (MSG 5973). $r^2 = 0.989$ for dinoseb WJ, r

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal 10/18/02 1029. bis(2-chloroisopropyl)ether -23.0%, 2,6-dinitrotoluene 26.5%
n-nitroso-di-n-propylamine -22.6%, 3-nitroaniline 31.9%
4-nitrophenol 2,4-dinitrophenol 24.1%, 4-nitrophenol 25.8%
2,4-dinitrotoluene 77.3%, 4-nitroaniline 73.4%
4,6-dinitro-2-methylphenol 39.0%, Dinoseb 37.6%.
4-bromophenyl-phenylether -21.2%, 2,4,6-Tribromophenol 29.4%
J.C

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]		✓
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

See LCS/LCSD

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS-1007D-MB All %Rs and RPDs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII60

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: information were not provided. check with lab

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
10/3/02	10/7/02	4 day	10/9/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-10070-RMB All ND's

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

I. Cal 10/8/12 (SGREC D) All %RSDs or r^2 were in control

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note:

10/8/12 1302

10/9/12 1010

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

10/9/02 1032. All %Ds were in control.

10/9/02 2106. Methoxychlor 17.7%/— J(+).

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

Storm-R-1 DCBP 28%/27%.
Storm-Q-1 DCBP 18%/16%. J/UJ.
Storm-Q-2 DCBP 12%/12%

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: See LCS/LCSD

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 10070-RMB All %Rs and RPDs were in control.

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[ ]		✓
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: _____

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		✓
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: _____

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note: _____

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[√]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 60

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: information were not provided

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
10/3/02	10/10/02	7 days	10/14/02	4 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 10/14/02 0671, ICal, QC, field sample.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-1010C-MB All NDs.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I. Cal. 10/14/02 (MSK5972) All %RSDs <15%
RRF ≥0.05 /nk

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal 10/14/02 1338 All %Ds <20%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 1010C-MB. All %Rs and RPDs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 3

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI60.

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp: information were not provided

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
10/3/02	10/7/02	4 days	10/8/02	1 day

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-1007W-SMB All ND's

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 9/28/12 (SGSBED). All %RSDs or r^2 were in control

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: C. Cal. 10/8/12 1210: MCPP —/-15.6%, MCPA -25.4%/-41.3%, 2,4-DB -17.5%/-24.0%
10/8/12 2320: MCPP 18.5%/—, 2,4-DB 26.7%/—

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - non-client sample (47119-9).
2,4,5-TP MS=115%↑ MSD=122%↑ (10-100)
2,4,5-T MS=132%↑ (25-128%)

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[ ]	✓	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 1007N-SMB Dalapon LCS = 100%↑ (26-97%)
2,4,5-TP LCS = 110%↑ (10-100%)
NDs in associated samples, ok.

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note: _____

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: _____

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: _____

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 3

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAR60
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T.
ICP	10/3/02	10/17/02	14 days
Hg	10/3/02	10/15/02	12 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	Action: R(+/-) J(+)/UJ(-) J(+) R(+)												
	Mercury < 65% 65% - 79% 121% - 135% > 135%												
	Other Metals < 75% 75% - 89% 111% - 125% > 125%												
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓						✓					
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: CRDL
Pb initial 64%, final 64%.
Se final 76%.
Na initial 72%
Tl initial 130%.
Se final 129%.

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓	✓						✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓							✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note: See attached.

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS? Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+) Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)	✓											
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note: LCS/LCSD - All %Rs and RPDs were in control.

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.			✓						✓			
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			✓						✓			
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.			✓						✓			
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: See MS/MSD - LCS/LCSD

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD - non-client sample %Rs and RPDs were in control.
Post-digestion Spike - storm-Q-1, Storm-R-1) All %Rs were in control

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: ICP-Serial Dilution Storm-Q-1 for K
Storm-R-1

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note:

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 3												
12.1.2	Number of target compounds in each analysis: 23												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: _____
Date: _____
Lab: __STL Savannah_____

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: _____

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: information were not provided

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 ^{o}C ± 2 ^{o}C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
10/7/02	10/11, 14/02	4, 7 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 10/1/02 0937. I Cal.
10/11/02 1039) fixed samples, QC.
10/14/02 0928

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB - 1L1011MB - All NDs
MB - 1L1014MB - All NDs.
TB - Acetone 6.0 ug/L, Styrene 0.82 ug/L → U, y at the RL — All NDs in associated samples, ok
TB - All NDs.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

I. Cal. 10/1/02 All %RSDs or r^2 were in control.
RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

— J.C

C. Cal. 10/11/02 1109 Acetone -31.9%.
1,2-dichloroethane -21.4%. — All ND's, or

10/14/02 1225 All %Ds <20%., RRF >0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 1L1011 MB. All %Rs and RPDs were in control.

LCS - 1L1014 MB All %Rs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 10

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII60

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: Information were not provided

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
10/7/02	10/15/02	8 days	10/24, 28, 29/02	9, 13, 14 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 10/15/02 0743 (MSG 5973) – I. Cal, 10/23/02 1041 (MSG 5973) – I. Cal.
10/26/02 1409 (MSG 5973) All %RSs were in control.
10/18/02 2259 – MB, LCS. 10/24/02 0757 —
10/28/02 0685 10/29/02 0630.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB – 1015C – MB. All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).	JA		
	Potential false negatives (use professional judgement) R(-)	JA ✓		
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: QC samples, ok

I. Cal. 10/15/02 (MSG 5973) Dinoseb r^2=0.989.
10/23/02 (MSZ 5973) 2-nitroaniline r^2=0.9885, 2,4-dinitrophenol r^2=0.9863
4-nitrophenol r^2=0.9867, 2,4-dinitrotoluene r^2=0.9891
4,6-dinitro-2-methylphenol r^2=0.9897, Dinoseb r^2=0.9872
10/26/02 All %RSDs or r^2 were in control.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal QC samples.

10/18/02 2313. Bis(2-chloroethyl)ether -24.4%, bis(2-chloroisopropyl)ether -23.4%
n-nitroso-di-n-propylamine -21.0%, 2,4-dinitrotoluene 21.8%.
10/24/02 0816 2,4-dinitrophenol 43.2%, 2,4-dinitrotoluene 25.6%.
4-nitroaniline 30.5%, 4,6-dinitro-2-methylphenol 24.0%
2,4,6-Tribromophenol >2.8%
10/28/02 0716 All %Ds < 20%.
10/29/02 0716 4-nitrophenol -23.3%.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - Soil - Q-16-0.5

Butylbenzylphthalate MS = 57% ↓ (58-122%).

Since MSD %R and LCS %R were in control, ok

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS-1015C-MB All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 8

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI61

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: information were not provided

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
10/7/02	10/15/02	8 days	10/21, 24, 28, 29/02	6, 9, 13, 14 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-1015P-IMB All ND's

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

I-Cal 10/17-18/12 All %RSDs or r^2 were in control on both columns.
(SGJECD)
10/18/12 All %RSDs or r^2 were in control on both columns
(SGIECD)

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note:

10/17/02 2026.
10/18/02 1329
10/21/02 1021
10/24/02 1534
10/28/02 1714
10/28/02 2139

All %Bs were in control

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

10/21/02 1046 (SG.JECD) 2,4-DCAA 17.3%/ — , DCBP 23.0%/ —

228-3, -4, -5, 230-2 → 10/21/02 2242 4,4'-DDD 26.8%/33.5%, 4,4'-DDT -48.6%/-62.7%, Methoxychlor -53.9%/-52.

2,4-DCAA 12.0%/ —

228-1, 228-2 → 10/24/02 1058 (SG.JECD) All %Ds were in control.

1740 4,4'-DDD — 127.9%, 4,4'-DDT -39.8%/-33.7%, Methoxychlor -35.0%/-30.0%

228-3DL, -4DL, -5DL → 10/28/02 1738 — See attached. — 4,4'-DDT and Methoxychlor %Ds were in control.

10/28/02 2203 — See attached

230-1, 230-2DL, 230-3 → 10/29/02 0228 — See attached.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

Soil-Q-16-0.5 (247228-1) TCMX 28%/ —

Soil-Q-18-0.5 (247288-3) TCMX 29%/29% J/UJ.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - Soil-Q-16-0.5

4,4'-DDE MS = 31% MSD = 32%.
Dieldrin MS = 13%, MSD = 15%.
4,4'-DDT MS = 0%, MSD = 0% → J/UJ.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS - 1015P-IMB All %Rs were in control.

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: _____

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		✓
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: _____

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI 61

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: information was not provided.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
10/7/02	10/16/02	9 day	10/21, 22/02	5, 6 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 10/14/02 0611 (MSK 5972) I. Cal.
10/21/02 0521 (MSK 5972)) field samples, QC
10/22/02 0715

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB- 1016A-MB All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I. Cal 10/14/02 MSK5972 All %RSDs < 20%.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

10/21/02 0739) All %Ds < 20%.
10/21/02 1534)

10/22/02 0846) All %Ds < 20%
10/22/02 1451)

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

Soil-Q-14-0.5 (250-2) surrogates were diluted-out (DF=10) [illegible]
Soil-Q-15-0.5 (250-3)

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - Soil-Q-16-0.5 (47228-1)

Hexa - MS = 39%, MSD = 27% ↓ (40-140%)
Hepta - MS = 32% MSD = 31% ↓
Octa - MS = 28% MSD = 28% ↓
Deca - MS = 16%, MSD = 15% ↓ (30-130%)

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS - 1016A-MB All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 8

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 61

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: information were not provided.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
10/7/02	10/14/02	7 days	10/17/02	3 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-1014N-SMB All ND3

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I Cal 10/14/12 All %RSDs or r^2 were in control (SGSTED)

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: C. Cal 10/16/12 2126 All %Ds <15%
10/17/12 1005 MCPA 18.9%/—, 2,4-D 25.4%/—

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD – non-client sample (47297A-1)
All %Rs and RPDs were in control.
only 2 spiking compounds

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 1014N-SMB All %Rs were in control

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAT 61
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T
ICP	10/7/02	10/18/02	11 days
Hg	10/7/02	10/16/02	9 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?	✓						✓					
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	Action: R(+/-) J(+)/UJ(-) J(+) R(+)												
	Mercury < 65% 65% - 79% 121% - 135% > 135%												
	Other Metals < 75% 75% - 89% 111% - 125% > 125%												
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: CRDL
Pb initial 64%, final 72%.
Se final 121%
Tl initial 128%.

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).		✓						✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS? Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)		✓										
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

Cd results J,n in 228-1, 228-4, 228-5, 250-1, 250-2, 250-3

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.			✓						✓			
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			✓						✓			
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.			✓						✓			
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: See MS/MSD.

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)		✓					✓					
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

%R > 125% (120%) 30% < %R < 74% (79%) %R < 30%

Positive	J	J	J
Non-detect	None	UJ	R

Note: MS/MSD - non-client sample.

Sb MS = 57% ↓ MSD = 62%. ↓

Mg MS = 155% ↑ MSD = 130%

Mn MS = 164% ↑ MSD = 167%

K MS = 132%

Post-digestion Spike

ICP - Soil-Q-16-0.5

Hg - Soil-Q-13-0.5

All %R's were OK

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: ICP Serial dilution - Soil-Q-16-0.5 Co %D = 10.8%

Hg Soil-Q-13-0.5 %D, OK

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: _____

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII62

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 2.3 and 2.5°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected		Date Analysed	HT
2/5/03		2/14/03	9 days
	MS/MSD	2/18/03	13 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 2/11/03 1137. I. Cal.
2/14/03 1002 Field samples
MSB5973 2/18/03 0944 MS/MSD.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:
MB-1B0214MB All NDs
MB-1B0218MB All NDs.

Trip Blank - TB-020503-KH All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 2/11/03 MSB5973 All %RSDs or r^2 were in control. RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	✓	[ ]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

2/14/03 1135 All %Ds < 20% RRF >0.05

2/18/03 1040. Bromomethane -50.6%. RRF = 0.03953 (use linear curve, ok).
↳ associated samples are QC samples (MS/MSD) ok

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

All surrogate recoveries were in control.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD - Leach-Q-1

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 1B0214MB. chloromethane 22% ↓ (34-145%) J/R
Vinyl chloride 32% ↓ (43-142%). R
LCS - 1B0218MB - All %Rs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note: Leach-Q-1 chloromethane, 1,1,1-TCA 1,1,2-TCA not perfect match with reference standards. - overlap or matrix interference.

12.0 TCL/TIC Quantitation and Reported Detection limits .

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: LEACH-Q-1 PF = 20.

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 2

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 3

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 95.5%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII62

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 2.3 and 2.5°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/5/03	2/12/03	7 days	2/19/03	7 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 2/14/03 1353. I. Cal.
MS6873. 2/19/03 0705

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB - 0212B - MB All NDs

80757-1 DF=200
80757-1DL DF=2000
80757-1MS DF=200
80757-1MSD DF=200

All surrogates were diluted out, ok

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 2/14/03. 2,4-dinitrophenol $r^2 = 0.9884$ (A) ~~UJ, r~~ UJ, r

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: (A)

2/19/03 0724 ~~All %RSD~~ All %Ds ≤ 20%.
(4-nitroaniline ≥0.1% ↑ ≈ 20%, ok)
instrument sensitivity increase

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

80757-1 DF=200
80757-1DL DF=2000
80757-1MS DF=200
80757-1MSD DF=200

All surrogates were diluted out. DL

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD - LEACH-Q-1 DF=200

All %Rs were diluted out. DL

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS - 0212B-MB Indeno(1,2,3-cd) pyrene 36% ↓ (37-140%)
R, 1

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 1

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 1

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 98.5%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: TA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII62

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 2.3 and 2.5°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/5/03	2/12/03	7 days	2/17/03	5 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 0212Q-RMB. All ND's

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 2/13/03 SGREED. All %RSD's < 20%

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note:

2/13/03 0919) All %Bs were in control
2/17/03 1007.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 2/17/03 1029 Methoxychlor -21.2%/-23.1% UJ
2/17/03 1531 All %Ds < 15% on both columns. UK

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:
80757-1
80757-1MS
80757-1MSD
Surrogates were diluted out (DF=100)

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]	✓	
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD - All spiking compounds were diluted out - due to abundance of target compounds in the native sample. - Summary form was not provided.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS - 0212Q-RMB All %Rs were in control.

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

80757-1	Bromonitrobenzene	397909 ↑	245.8%
80757-1MS	"	362800 ↑	224.1%
80757-1MSD	"	382400 ↑	236.2%

80956-242866

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: LEACH-Q-1 DF=100.

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		✓
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[ ]	✓	

Note:

80757-1	Bromonitrobenzene	397909 ↑	245.8%
80757-1MS	"	362800 ↑	224.1%
80757-1 MSD	"	382400 ↑	236.2%

80956-242866

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 1

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII62

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 2-3 and 2.5°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/5/03	2/12/03	7 days	2/21/03	9 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 2/20/03 1010. I. Cal
2/21/03 0812 field sample.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB - 0212D - MB - All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I. Cal. MSK6972. 2/20/03.
All %RSDs were in control.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

2/20/03 1821.
2/21/03 0915
2/21/03 1716
All %Ds < 20%.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

80757-1
80757-1MS
80757-1MSD
DF=10.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

LBAeH-Q-1 Dichlorobiphenyl MS=1.4%, MSD=0%. (30-150%).
DF=10

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS- 02120-MB. All %Rs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[ ]	✓	

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

80757-MSD	Phenanthrene-d10.	76330 ↓	48.1%
	Chrysene-d12	45639 ↓	64.3%

QC sample, N

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

LEACH-Q-1 DT-=10

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 1

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII62

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 2.3 °C / 2.5°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/5/03	2/11/03	6 days	2/27/03	16 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-02110-SMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: SGSECD. 2/11/03 All %RSDs <20% on both columns

SGRECD. 2/26/03 All %RSDs or r^2 were in control.

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

SGSECD (2/12/03 1346 / 2/12/03 2049) All %Ds <15% on both columns.

2/27/03 0756 MCPA -17.3%/-23.6%

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[✓]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: 80757-1
80757-1MS
80757-1MSD. } DF = 50,000.

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[•]	✓	
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - DF = 50,000. spiking compounds were diluted out. pk summary form was not provided

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only. only LCS.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 02110-SMB. All %Rs were in control

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: LBACH-Q-1 DF=50,000

2,4-D RPD= 37.3% /

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 1

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAI62
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note: Cooler temp. 2.3°C and 2.5°C

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T
ICP	2/5/03	2/18/03	13 days
Hg	2/5/03.	2/12/03	7 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	Action: R(+/-) J(+)/UJ(-) J(+) R(+)												
	Mercury < 65% 65% - 79% 121% - 135% > 135%												
	Other Metals < 75% 75% - 89% 111% - 125% > 125%												
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

r=0.999513 /JK.

Note: CRDL
Fe 76%/61%
Pb 76%/—
Tl 74%/79%
Hg 78%/—

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓					

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓						✓					
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)			✓									
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.												

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

ICP LCS/LCSD — All RPDs were in control.
Hg LCS

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: See MS/MSD, and LCS/LCSD. All RPDs were in control.

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.) %R > 125% (120%) — Positive: J; Non-detect: None. 30% < %R < 74% (79%) — Positive: J; Non-detect: UJ. %R < 30% — Positive: J; Non-detect: R	✓						✓					
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD - LBACH-Q-1. All %Rs and RPDs were in control.
(Several %Rs were out - sample conc. > 4X spiking conc. OK)
post-digestion spike - All %Rs were in control.

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: Serial dilution - LBACH-Q-1

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note:

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 1												
12.1.2	Number of target compounds in each analysis: 23												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA.
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII63

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 ^{O}C $\pm$ 2 ^{O}C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
2/10/03	2/14, 17/03	4, 7 days
2/11/03	2/14/03	3 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: 2/11/03 0944 I. Cal.
MSB5973 2/14/03 1002) QC, field samples
2/17/03 1022)

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB- 1B0214MB All NDs
1B0217MB All NDs.

TB-021003-KH All NDs
TB-021103-BH All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: MSB5973 - 2/11/03 All %RSDs or r^2 were in control.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

2/14/03 1135 All %Ds <20%, RRF >0.05

2/17/03 1148 Bromomethane -25.4%; All other %Ds < 20%
RRF >0.05

→ BDRK-Q-1) Bromomethane was non-detected in these two samples, OK.
BDRK-R-1)

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

BDRK-Q-1 (80862-1).

Dibromofluoromethane (DFM). 100% / N. 248.484/250 = 99.4%

Toluene-d8 (TOL) 98% / N 240.138/250 = 96.1%

p-Bromofluorobenzene (BFB) 108% / N 269.400/250 = 107.8%

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

MS/MSD - 80575-1 (ZBACH-Q-1) in SDG SAI62 All %Rs and RPDs were in control.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: LCS - 1B0214MB All %Rs were in control, except Chloromethane 22%, vinyl chloride 32%
LCS - 1B0217MB All %Rs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note: BDRK-Q-1 CS2. mass spectra match with reference standard.
BDRK-R-1. Toluene, chlorobenzene, o-xylene, styrene → matrix interference or overlap with other compounds.

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: BDRK-O-1 BDRK-O-1-DUP.
VOCs All NDs All NDs

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 8

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 12

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 95.5%

Note:

BDRK-R-1

Acetone 14 ug/L / ✓ $\frac{8715 \times 250}{341217 \times 0.09299 \times 5} = 13.73$ ug/L

CS_2 3.4 ug/L / ✓ $\frac{35003 \times 250}{341217 \times 1.5086 \times 5} = 3.40$ ug/L

Toluene 1.0 ug/L / ✓ $\frac{13493 \times 250}{887494 \times 0.7601 \times 5} = 1.00$ ug/L

Chlorobenzene 4.7 ug/L / ✓ $\frac{69759 \times 250}{382265 \times 1.9385 \times 5} = 4.71$ ug/L.

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII63

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/10/03	2/12/03	2 days	2/19/03	7 days
2/11/03	2/18/03	7 days	2/28/03	10 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

MSG5973 2/14/03 1353 I. Cal.
2/19/03 0705 QC, 80862-1,2
MSE5973 2/27/03 1726 I. Cal.
2/28/03 1126. QC, 80901,-1,2,3

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB-0212B-MB All NDs

MB-0218C-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: MSG5973 - 2/14/03 2,4-dinitrophenol r^2=0.9884, All other %RSDs or r^2 were in control.

MSE5973 2/27/03 All %RSDs or r^2 were in control.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: MSG5973 2/19/03 0724 All %Ds ≤ 20%, RRF > 0.05
(4-nitroaniline 20.1% ≈ 20%, OK)

MSE5973 2/28/03 1142 All %Ds < 20%, RRF > 0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]

Note: BDRK-R-1 (8380862-2).

2-Fluorophenol	67%	69.298/100 = 69.3%	minor rounding error
Phenol-d5	74%	77.187/100 = 77.2%	
Nitrobenzene-d5	74% / ✓	36.6411/50 = 73.28%	
2-Fluorobiphenyl	74% / ✓	36.8692/50 = 73.74%	
2,4,6-Tribromophenol	86%	89.27/100 = 89.3%	minor rounding error.
Terphenyl-d14	36% / ✓ (14-148%).	17.5348/50 = 35.07%	

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]	✓	
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

MS/MSD - LZAEH-Q-1 (80757-1) in SDG SAI68 — All spiking compounds were diluted out!

MS/MSD - BDRK-Q-2 (80989-1 in SDG SAI64). — All %Rs and RPDs were in control.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

LCS - 0212B-MB Indeno (123-cd) pyrene 36% ↓ (37-140%) → B0862-1 R,1
0218C-MB All %Rs were in control. -2 R,1

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note: BDRK-R-1. 1.2-dichlorobenzene, 4-chloroaniline → match with reference standard.

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL) All NDs	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		

For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.

Note: BDRK-Q-1 BDRK-Q-1-Dup.

SVOCs All NDs All NDs

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 5

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 2

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 99.4%

Note:

BDRK-R-1

1.2-dichlorobenzene 1.2 ug/L/N $\frac{5988 \times 40 \times 1000}{132410 \times 1.5355 \times 940} = 1.25$ ug/L

4-chloroaniline 120 ug/L/N $\frac{789371 \times 40 \times 1000}{602052 \times 0.4463 \times 940} = 125.01$ ug/L

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII63

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement?	[✓]		

If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/10/03	2/12/03	2 days	2/14/03	2 days
2/11/03	2/18/03	7 days	2/20/03	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB-0212Q-IMB All NDs

0218N-MMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: SGMECD 1/15/03 All %RSDs or r^2 were in control on both columns

SGIECD 2/4/03 All %RSDs or r^2 were in control.

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note:

SGMECD. 1/15/03 1059 I. Cal
2/20/03 0854 QC, field samples

SGIECD 2/4/03 0934 I. Cal.
2/14/03 0925 QC, field samples

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[✓]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: SGIBCD 2/14/03 0949. 4,4'-DDD —/-21.6%, Endosulfan II —/-20.7%, 4,4'-DDT —/-47.1%
80862-1 → Endrin aldehyde —/-20.3%, Endosulfan sulfate —/-18.0%
-2 Methoxychlor 16.1%/—, Endrin ketone —/-18.6%.
All NDs, ok 2/14/03 1545 All %Ds were in control on both columns.

SGMBED 2/20/03 0918 Endosulfan I 16.3%/—, 4,4'-DDD 19.9%/—, 4,4'-DDT —/-16.3%
80901-1 → Methoxychlor —/-16.4%, Endrin ketone 23.0%/—
-2 2/20/03 1725 Endosulfan I 16.6%/—, Endrin ketone 22.5%/—
-3 All NDs, ok

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

BDRK-R-1 DCBP 13%/11%. (30-150%). J/UJ
80862-2

BDRK-S-1 DCBP —/28% ok, since all other %Rs were in control.
80901-3

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note: MS/MSD - BDRK-Q-2 All %Rs and RPDs were in control
(80989-1, SDG: SAII64)

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: LCS - 0212Q-IMB
0218N-MMB) All %Rs were in control.

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns. All NDs	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note: All fieldsamples - NDs.

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note: BDRK-O-1 BDRK-Q-1-Dup
Pesticides All NDs All NDs

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 5

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII63

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/10/03	2/12/03	2 days	2/20/03	8 days
2/11/03	2/18/03	7 days	2/24/03	6 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSK5972 2/20/03 1010. I. Cal. QC, 80862-1, 2
2/21/03 0812 MB- 0212D-MB.
2/24/03 0932 80901-1, 2
2/25/03 0700 QC 80901-3.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB - 0212D-MB All ND's

MB- 0218D-MB All ND's.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

MSK5972 2/20/03 All %RSDs < 20%

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

MSK5972 2/21/03 0915 All %Ds < 20%
1716 All %Ds < 20%

2/20/03 1821 All %Ds < 20%
2/24/03 1039
1813 All %Ds < 20%
2/25/03 1801
1845

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

80901-1 $^{13}C_{12}$- Decachlorobiphenyl 56% / ✓ 1.34388/2.5 x 0.95 = 56.6%

80862-1 " 72% / ✓ 1.75801/2.5 x 0.99 = 71.0%

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

MS/MSD - LEACH-Q-1 Dichlorobiphenyl MS = 1.4%, MSD = 0%. — not diluted out

MS/MSD - BDRK-Q-2 All %Rs and RPDs were in control.
(80989-1, SDG: SAI64)

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

LCS - 0212D-MB All %Rs were in control.
0218D-MB "

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note: All NDs in associated field samples.

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. All NDs.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: BDRK-0-1 BDRK-0-1-DUP

PCBs All NDs All NDs.

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 5

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII63

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]		

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/10/03	2/14/03	4 days	2/17/03	3 days
2/11/03	2/14/03	3 days	2/17/03	3 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]	✓	✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: MB - 0214W-SMB All ND's

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: SGSECD - 2/11/03 All %RSDs < 20%

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: SGSECD. 2/17/03 1159 2,4-DB —/-19.8% All ND's, JL
2/17/03 2126 2,4,5-T —/-16.0%. J(+)

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]

Note: 8082-1 2,4-DCAA 120% / W 0.23570/0.2 = 117.8%
90% / W 0.17907/0.2 = 89.5%

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: No MS/MSD-

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[ ]	✓	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: LCS-LCSD - 2,4,5-TP LCSD = 110% ↑ (10-100%)

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note: For all positive detections, RPDs < 40%, ok

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✓]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
11.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note:

	BDRK-0-1	BDRK-0-1-DUP	Difference	RL
2,4-D	0.50 U	0.35	0.35	0.5
2,4,5-T	0.50 U	0.041	0.041	0.5

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 5

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

BDRK-Q-1 (80862-1)

Dicamba 0.094 ug/L/N $\frac{20116032 \times 10 \times 1000}{2176356124 \times 980} = 0.0943$ ug/L

MCPA 11 ug/L/N $\frac{3237766 \times 10 \times 1000}{3081313 \times 980} = 10.72$ ug/L

2,45-TP 0.15 ug/L/N $\frac{42314656 \times 10 \times 1000}{2907043914 \times 980} = 0.149$ ug/L

2,4,5-T 0.11 ug/L/N $\frac{30156931 \times 10 \times 100}{2870463093 \times 980} = 0.107$ ug/L

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAI163
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T
ICP	2/10,11/03	2/18/03	7-8 days
Hg	2/10,11/03	2/14/03	3-4 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓						✓					
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.		✓						✓				

Action:

	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: CRDL.
Fe 76%/ 61%
Pb 76%/ —
Tl 74%/ 79%
Hg 72%

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓					

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓						✓					
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		✓						✓				

Note: _____

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)		✓										
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.		✓										

Note: _____

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.		✓						✓				

Note: _____

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.		✓						✓				

Note: See MS/MSD and LCS/LCSD

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.		✓						✓				

Note: ICP MS/MSD - LEACH-Q-1 (80575-1 in SDG SAII62) All %Rs and RPDs were in control.
Hg MS/MSD - BDRK-P-1 All %Rs and RPDs were in control.

Post-digestion Spike BDRK-Q-1 All %Rs were in control.
BDRK-P-1

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.		✓						✓				

Note: ICP Serial Dilution - BDRK-Q-1
Hg Serial Dilution BDRK-P-1

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓						✓					
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)		✓						✓				
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.		✓					✓					
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note:

	BDRK-0-1	BDRK-0-1-Dup.	Difference/RPD		
Hg					All NDs; OK
Al	0.33	0.095	0.235		RL=0.20.
Ba	0.22	0.22	—		
Ca	220	200		9.5% ✓ ok	
Cu	0.0015	0.020U.	0.0015		RL=0.020.
(*) Fe	0.71	0.41	0.3	53.6%	RL=0.05 → J/UJ, f
Mg	66	64.		3.1%.	

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 6												
12.1.2	Number of target compounds in each analysis: 23												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

	BDRK-0-1	BDRK-0-1-Dup.	Difference/RPD	RL
Mn	0.063	0.058	6.6%	
K	7.1	6.8	4.3%	
Se	0.0050	0.010U.	0.005 ✓ ok	0.010.
Na	140	130.	7.4%	
Zn	0.0049	0.020U.	0.0049 ✓ ok	0.020.

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II III (IV)
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII63
Test Name: Methane
Method No.: SOP AR30.

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
2/10/03	2/18/03	8 days.
2/11/03	2/18-19/03	7-8 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: I. Cal (VMTFID) 1/17/03 $r^2 = 0.98695$ → J/UJ.✓
C. Cal 2/18/03 1317 %D < 15%.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: MB - 1C0218 MB - All NDs

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes:

LCS/LCSD - Methane LCS = 95%, LCSD = 82% ; RPD = 15%
(75-125%) (< 30%)

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

See LCS/LCSD.

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	≠	✓	
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	✓		

Notes:

	BDRK-0-1	BDRK-0-1-Dup.	RPD	
Methane	43	12	112.7%	→ out !! previously flagged due to calibration fa ok
			31/27.5	

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes: BDRK-Q-1 Methane 18 ug/L / [illegible]

249483 x 0.000071912 = 17.94 ug/L

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 6			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

ure,

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II III (IV)
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL- Savannah
SDG No.: SAII63
Test Name: Nitrate-N.
Method No.: EPA 353.2

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed.	H.T.
2/10/03	2/12/03	2 days
2/11/03	2/13/03	2 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: I. Cal 2/12/03 r=0.9996. 2/13/03 r=0.9996
ICV/CCV All %Rs were in control.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND. PBW-2 ND.
ICB/CCB All NDs.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD - 80901-1.
NO_3-N MS = 93%, MSD = 93%.
0.187/0.2 0.187/0.2
= 93.5%. = 93.5%.

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only LCS.	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 88%
LCSW-2 91%.

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: Lab dup. 80897-4 * 0.103/0.103 RPD=0%
80908-5 * 17.175/17.172 RPD=0%
* - non-client samples.

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.		✓	

Notes: BDRK-0-1 BDRK-0-1-Dup.
NO_3-N ND ND.

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 6			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II III (IV)
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII63
Test Name: Alkalinity / CO_2
Method No.: 310.1

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
2/10,11/03	2/19/03	8-9 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			✓
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			✓
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSW-1 Alkalinity LCS = 96.7% VP 147.9/153.0 = 96.67%

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: Lab dup - 80882-1 BDRK-Q-1 414.1 /443.2 RPD=6.8%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.		✓	

Notes:

	BDRK-O-1	BDRK-O-1-Dup.	RPD
Alkalinity	489.8	492.7	0.6%
CO_2	15	9.6	43.9%

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II III (IV)
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII63
Test Name: Sulfate
Method No.: 375.4

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
2/10/03	2/13/03	3 days
2/11/03	2/13/03	2 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: I. Cal. 2/13/03 r = 1.000.
ICV/CCV All %Rs were in control.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?		✓	✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: ICB/CCB — All NDs
PBW-1 ND.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes: Batch QC S380791-1
No MS/MSD analyzed. MS = 81% / MSD = 85% / RPD = 3.0%.

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS - 104%/ok 19.743/19 = 103.9%

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: Lab dup. M360961-2* ND / ND, ok.
* non-client sample.

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.		✓	

Notes:

	BDRK-0-1	BDRK-0-1-Dup.	RPD
Sulfate	210	220	4.7%

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII64

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
2/12/03	2/26/03	14 days
2/13/03	2/25/03	12 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSD5973 2/25/03 0829. I. Cal.
2/25/03 1935 QC field samples

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:
MB-200225MB All NDs
Trip Blank - TB-021303-BH. All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: MS05973 - 2/25/03 All %RSDs or r^2 were in control.
RRF > 0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: MS05973 - 2/25/03 1959

Bromomethane	-74.4%	UJ, C	
Chloroethane	-76.2%		
Acetone	-23.0%		J(+)
2-butanone	-20.6%	ok	J(+)
Bromoform	-25.2%		All NDs ok

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - BDRK-Q-2

All %Rs and RPDs were in control.

9. Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 200225MB All %Rs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: LEACH-R-1 analyzed a 2000X dilution

LEACH-R-1-Dup. analyzed at a 1000X dilution.

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

	LEACH-R-1	LEACH-R-1-DUP.	Difference / RPD		RL
1.1-DCE	2000 U	310.	310 / N		2000
Acetone	45000	37000		19.5%	
CS_2	2000 U.	520	520 / N		2000
CH_2Cl_2	2400	2500		4.1%	
2-butanone	10,000	8500		16.2%	
chloroform	2600	2400		8%	
Benzene	7600	7700		1.3%	
1.2-DCA	60000	63000		4.9%	
TCE	180000	180000		—	
MIBK	2100	2100		—	
Toluene	25000	26000		3.9%	
PCE	37000	34000		8.5%	
Chlorobenzene	1400	1200		15.4%	
1.2-DCE	20000	21000		4.9%	
Xylene	4100,	600.	3500 / N <2XRL		2000

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI264

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/12/03	2/18/03	6	2/28/03	10
2/13/03	↓	5	↓	10
2/11/03		7		10

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSE 5973 2/27/03 1726. I. Cal.
2/28/03 1126 QC field samples
3/3/03 0757 Dilution analysis.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0218C-MB All NDs.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: MSE5973 2/27/03 All %RSDs or r^2 were in control. RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 2/28/03 1142 All %Ds < 20%, RRF > 0.05

3/3/03 0812 4,6-dinitro-2-methylphenol 26.6% RRF >0.05
4-bromophenyl-phenylether 20.7%
Benzo(k)fluoranthene -26.9%

→ 80898-5DL, 80898-6DL — All NDs

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[✓]		
	Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.			

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

BDRK-P-1 T-erphenyl-d14 8%. → All base/neutral results R.s
↳ This sample was not re-analyzed by the lab
Leach-R-1 DF=20/DF=400 } All surrogates were diluted out, ok
Leach-R-1-Dup DF=20/DF=400

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD - BDRK-Q-2 (80989-1) All %Rs and RPDs were in control

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 0218C-MB All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]	✓	
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[ ]	✓	

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 51

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 80.4%

Note:

	Leach-R-1	Leach-R-1-Dup.
Phenol	1300000	1400000
2-chlorophenol	10000	24000
3&4-Methylphenol	5600	9200
2,4-dimethylphenol	440	1600
4-chloroaniline	47000	150000
2-nitroaniline	2900	
Dimethyl phthalate	3000	
4-nitroaniline	26000	
Di-n-butylphthalate	2900	

see attached worksheet

JA

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII64

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/13/03	2/18/03	5 days	2/20/03	2 days
2/18/03	2/24/03	6 days	2/26/03	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0218N-MMB All NDs

0224N-MMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: SGMBCD 2/17/03 All %RSDs or r^2 were in control on both columns.

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note:

1/25/03 1059.
2/20/03 0852
2/21/03 1116
2/26/03 1129

All %Bs were in control

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 2/20/03 0918: Endosulfan I 16.3%/—, 4,4'-DDD 19.9%/—, Endrin ketone 23.0%/—
4,4'-DDT —/-16.3%, Methoxychlor —/-16.4%.
2/20/03 1725: Endosulfan I 16.6%/— ~~Endrin aldehyde 15.4%/—~~, Endrin ketone 22.5%/—
~~4,4'-DDT —15.4%/—~~ OK ≈15% (TA) ~15% ok (M)
2/21/03 1140 Endosulfan I 15.9%/—, 4,4'-DDD 26.1%/—, Endrin ketone ~~19.0%~~ 19.7%/—
4,4'-DDT —20.9%/—, en
2/21/03 1656 Endosulfan I 15.9%/— 4,4'-DDD 16.3%/—, ~~Endrin~~ 4,4'-DDT —/-18.5%)
4,4'-DDT —/18.5%, endrin ketone 22.3%/—
2/26/03 1153 All %Ds < 20% 2/26/03

7.0 Surrogate Recovery

2/26/03 2301 4,4'-DDE —/17.4%, 4,4'-DDD —/16.8%.

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

BDRK-P-1 DCBP 17%/16%. → J/UJ

Leach-R-1 DF=200
Leach-R-1-Dup DF=50,000.) surrogates were diluted out!

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - BDRIC-Q-2 All %Rs and RPDs were in control.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 0218N-MMB. All %Rs were in control.

LCS/LCSD - 0224W-MMB gamma-chlordane LCS = 44% ↓ (54-128%) RPD = 69% (<18%).

J/UJ

BDRIC-P-1

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: Endrin aldehyde in BDRIC-P-1 RPD = 186.4% → J's due to surrogate recovery failure

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note:

	LEACH-R-1	LEACH-R-1-DUP	Difference/RPD
Pesticides	ND	ND	—
	DF = 200	DF = 50,000.	

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 41

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII64

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/13/03	2/18/03	5 days	2/25/03	7 days
			2/24/03	6 days - Leach-R-1
2/18/03	2/25/03	7 days	2/26/03	1 day

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSK5972 2/20/03 1010 I. Cal.
2/25/03 0700. BDRIC-Q-2, MS/MSD, Leach-R-1-Dup, Leach-R-1-Dup-D1.
2/24/03 0932 Leach-R-1
2/26/03 0825 BDRIC-P-1

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-0218D-MB All NDs

MB-0225C-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

MSK5972 2/20/03. All %RSDs < 20%

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

2/24/03 1039) All %Ds < 20%.
2/24/03 1813)

2/25/03 0801) All %Ds < 20%.
2/25/03 1545)

2/26/03 1308) All %Ds < 20%
2/26/03 0927)

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[✓]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

Leach-R-1 (80989-5) DF=10
Leach-R-1-Dup (80989-6) DF=100
Leach-R-1-Dup DL (80989-6DL) DF=200

surrogates were diluted out

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - BDRK-Q-2 (80989-1)

All %Rs and RPDs were in control.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS - 0218D-MB All %Rs were in control.

LCS/LCSD - 0225C-MB. All %Rs and RPDs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: Leach-R-1 DF=10 — All NDs
Leach-R-1 Dup. Trichlorobiphenyl exceeded the linear range J, g
use ~~re~~ diluted result

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]	✓	
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

Leach-R-1 DF=10 All NDs.
Leach-R-1-Dup. All positive detected.

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

	Leach-R-1 DF=10	Leach-R-1-Dup. DF=100/200.
Mono-	22 U	1100
Di-	22 U	7900
Tri-	22 U	~~5~~ 31000
Tetra	43 U	57000
Penta-	43 U	50000
Hexa	43 U	21000
Hepta	65 U	5200
Octa-	65 U	960
Nona-	110 U	240
Deca-	110 U.	270.

All J/UJ.

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII64

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
2/13/03	2/18/03	5 days	2/27/03	9 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-02180-SMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: SGSECD 2/24/03 All %RSDs were in control on both columns

SGRECD 2/26/03 All %RSDs or r^2 were in control on both columns

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: SGSECD 2/25/03 1042 – see attached
↳ Associated samples are QC samples, etc

SGRECD 2/27/03 0756 – MCPA –17.3%/–23.6% → UJ, L

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[✓]		

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: Leach-R-1) DF=100. due to matrix interference.
Leach-R-1-Dup)

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD-BDRK-Q-2 Dalapon MS= 110%↑ MSD= 115%↑ (26-97%)
2,4,5-TP MS= 110%↑, MSD=120% (10-100%)
All NDs in associated samples, ok

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only. only LCS.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS-02180-MB. All %Rs were in control.

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note: All NDs in associated samples
Samples Leach-R-1 and Leach-R-1-Dup were analyzed a 100x dilution due to non-target matrix interference.

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns. All NDs	[ ]		✓
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✓]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]	✓	
11.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note:

	Leach-R-1	Leach-R-1-Dup
	DF=100	DF=100 x 2.5 = 250 x dilution
Herbicides	All NDs	All NDs

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 4

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAI64
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed	H.T.
ICP	2/13/03	JA 2/25/03	14 days
Hg	2/13/03	2/25/03	12 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓			✓		
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: CRDL

As 122%/ –
Fe 78%/ –
Pb 76%/ –

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓	✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓					

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓						✓					
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓							✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)				✓								
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis?. Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: See MS/MSD All RPDs were in control

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD - BDRK-Q-2 All %Rs and RPDs were in control.

Post-digestion Spike - All %Rs were in control

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: Serial Dilution BDRK-Q-2

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓						✓					
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)		✓						✓				
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓						✓					
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: Leach-R-1 / Leach-R-1-Dup.

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV

Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAJ64
Test Name: Methane
Method No.: SOP AR30

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
2/13/03	2/24/03	11 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal. 1/17/03 (FID) r^2=0.98695 → J, r
C. Cal 2/24/03 1321 %Ds < 15%

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: MB - 1C0224MB NP.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD - BDRK-Q-2 MS=112% MSD=122% (75-125%)
RPD=8% (<30%)

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only LCS	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?			✓

Notes: LCS - 1CU224MB3. LCS = 82% (75-125%)

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

See MS/MSD.

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JTA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII64
Test Name: Nitrate
Method No.: EPA 353.2

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
2/13/03	2/14/03	1 day

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: I. Cal. r = 0.9996.
ICV/CCV All %Rs were in control.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 (same as ICB) ND
ICB/CCB All NDs

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?			✓

Notes: MS/MSD - BDRK-Q-2 MS = 89% MSD = 88%
RPD = 1.7%

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only LCS	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?			✓

Notes: LCSW-1 91%

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes: S380897-4* 0.103/0.103 RPD=0.0%

* non-client sample

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

Only one sample - BDRK-Q-2 ND.

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 1			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JTA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII 64
Test Name: Alkalinity / CO_2
Method No.: EPA 310.1

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
2/13/03	2/19/03	6 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			✓
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			✓
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND (< 1.0)

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only LCS.	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?			✓

Notes: LCSW-1 96.7% 147.9/153.0

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			
7.4	Were there any transcription /calculation errors?			

Notes: S380862-1⊛ 414.1 mg/L / 443.2 mg/L RPD = 6.8%

⊛ non-client sample.

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

Only one sample

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 1			
10.1.2	Number of target compounds in each analysis: 1 / 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ✓ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII64
Test Name: Sulfate
Method No.: 375.4

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
2/13/03	2/20/03	7 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal. r = 1.000.
ICV/CCV — All %Rs were in control (90-110%)

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: PBW-1 ND
ICB/CCBs All NDs.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD - BDRK-Q-2 MS = 144% ↑, MSD = 150% ↑
28.868/20 29.921/20
144.34% = 149.61%.

BDRK-Q-2 Sulfate ND, ok

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes: LCSW-1 105% 20.032/19 = 105.4%

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

See MS/MSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

BDRK-Q-2 ND

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 1			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSL5972 - 11/15/02 1211 I. Cal.
11/20/02 0842 QC, field samples.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB: LL1120 MB All NDs

Trip Blank - 11/6/02 All NDs

Trip Blank - 11/7/02 chloromethane ~~0.51 ug/L~~ 1.0 ug/L JL
(see SDOS DV report)

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995? Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-). Potential false negatives (use professional judgement) R(-)	[ ]	✓	
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

MSL5972 11/15/02 chloromethane $r^2 = 0.9886$ UJ, r
All other %RSDs or r^2 were in control
RRF ≥0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

MSL5972 11/20/02 0929 Bromomethane 30.9% ↑ — All NDs, ok
2-butanone −22.9% ↓ J(+)
RRF ≥0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

No MS/MSD in this SDG. See LCS/LCSD

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria? 2 RPDs were out	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS/LCSD - 1L1120MB

Acetone RPD= 54% (28%) J(+)

1,2-dichloroethane RPD=26% (25%). — All NDs, ok

All %Rs and other RPDs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

		Yes	No	NA
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	judgement.	[ ]	✓	
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: R6AM1S / R6AM2S – Styrene Difference > 2XRL J/UJ

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 7

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

	R6AM1S	R6AM2S	Difference / RPD		RL
Acetone	150	24	126		25
2-butanone	5.5	51 U	5.5		51
Toluene	12	14	2		7.4
Ethyl Benzene	16	14	2		7.4
→ Styrene	37	10 U	37		~~10~~ 7.4
Xylene	73	81		10.4%	15

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSE5973 11/18/02 0640 I. Cal.
11/20/02 1231
11/22/02 1544 I Cal.
11/27/02 0714
12/2/02 0808 I. Cal / field samples.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	✓ [ ]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB - 1114F-MB Bis(2-ethylhexyl)phthalate 19 ug/kg
Benzo(a) pyrene 22 ug/kg
Indeno(1,2,3-cd)pyrene 23 ug/kg
Benzo(g,h,i)perylene 28 ug/kg
) 1/2 of the RL.

1122A-MB All ND's

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: MSE5973 11/18/02 All %RSDs or r^2 were in control. $\overline{RRF}$ ≥0.05
11/22/02 All %RSDs or r^2 were in control. $\overline{RRF}$ >0.05
12/2/02 All %RSDs or r^2 were in control. $\overline{RRF}$ ≥0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:
11/20/02 ~~Bis(2-ethylhexyl)phthalate -20.4% ≈ 20%~~ OK All other %Ds <20% OK
(JB)
11/27/02 0815 Hexachlorocyclopentadiene 32.2% ↑ → ND, Dinoseb 26.3% ↑ → ND
All RRF ≥0.05
4805)-2RE
Do used for

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[✓]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]	✓	
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: Note base/neutral

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

R6FUIS (48057-1) 2-Fluorobiphenyl 21% ↓ (30-120%) Terphenyl-d14 28% ↓ (30-131%)
R6BDIS 2-Fluorobiphenyl 25% ↓
R6BM2S 2-Fluorobiphenyl 25% ↓

All samples were re-extracted and re-analyzed and displayed acceptable recoveries.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - 48467-4 All %Rs and RPDs were in control.
(non-client samples)
MS/MSD - R5BM3S. 35 MS %Rs and 29 MSD %Rs → < LCL
(48126A-1). 2 RPDs > acceptance limits.
- (SII130)

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

LCS-1114F-MB All %Rs were in control.

LCS-1122A-MB All %Rs were in control.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

	R6AM1S	R6AM2S	Difference	RL
Fluoranthene	630U	56	56	630
Chrysene	630U	38	38	630
Bis(2-ethylhexyl)phthalate	41	730U	41	730

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 7

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: TB
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 511B04

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/6,7/02	11/14/02	7.8 days	11/17/02	3 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 1114P - RMB All ND's.

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: SGRECD. 11/15/02 All %RSDs or r^2 were in control on both columns.

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: SGRECD 11/15/02 1206 All %Bs were in control

11/17/02 1621 All %Bs were in control

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: SGRECD 11/17/02 1643 4,4'-DDE -16.3%/—, 4,4'-DDD —/-18.7%,
4,4'-DDT -20.7%/—, Endrin aldehyde -16.3%/—
Methoxychlor -28.0%/-32.0%, 2,4-DCAA 16.8%/—
UJ

11/18/02 0134 ~~4,4'-DDE —/20.8%, 4,4'-DDD —/16.1%, e~~ (TA)
4,4'-DDE -20.8%/—, 4,4'-DDD 16.1%/—
4,4'-DDT -41.2%/-32.4%, Endrin aldehyde —/-15.5%.
2,4-DCAA 16.4%/—
UJ

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: R6BU1S TCMX —/29% OK, no action was taken.
R6BMIS TCMX 26%/23%. J/UJ
R6BM2S TCMX 14%/11%.
R6BMIS TCMX 10%/8% DCBP 21%/25%. J/R
R6CMIS TCMX 6%/6% J/R

→ re-extracted on 11/19/02, analyzed on 11/21/02, and displayed similar results, only raw data provided in this data package.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - R5AM3S All %Rs and RPDs were in control.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 1114F-RMB All %Rs were in control.

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: Several results had RPDs > 40%, ~~J, ge~~ (JA) These results were previously flagged due to calibration or surrogate recovery failure, OK.

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note:

	R6AM1S	R6AM2S	Difference	RL
Aldrin	2.1	3.8 U	2.1 ✓	3.8
gamma-chlordane	3.3 U	0.45	0.45 ✓	3.3
4,4'-DDE	0.73	1.5	0.77 ✓	7.3
Dieldrin	0.55	7.3 U	0.55 ✓ OK	7.3

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-).	[✓]		

If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[~~✓~~] JA	✓	

14.1.1 Number of samples: 7

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: ~~0~~ 39

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 73.5% ~~100%~~ JA

Note: non-detects in samples R6BMIS and R6CMIS were rejected due to surrogate recovery failure.

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: S11B04.

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/6,7/02	11/14/02	7,8 days	11/22/02	8 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".	✓		
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSK5972 11/20/12 1310 I Cal.
11/20/12 0524. QC, field samples

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

MB-1114E-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

MSK5972 11/20/02 All %RSDs < 20%.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

MSK5972 11/22/02 0646) All %Ds < 30% (OK for soil/sediment samples).
11/22/02 1466)

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

		Yes	No	NA
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

MS/MSD - R5AM3S (S11B07) ~~All %RSDs or 1~~ (A)

All %Rs and RPDs were in control.

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 1145-MB. All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: R6AM1S R6AM2S

PCBs All NDs All NDs

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 7

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: S11B04

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:
Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/6,7/02	11/13/02	6.7 days	11/15/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 1113N-SMB. All NDs.

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: SGSECD 11/8-9/02 All %RSDs or r^2 were in control on both columns.

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: SGSECD 11/15/02 1726 2,4-DB -20.5%/— NDs in associated samples, %D in control on confirmation column, ok

11/16/02 0449 2,4-DB ~~-15.2%~~/— ≥15%, ok

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - RSAM3S. (511307). — check %Rs and RPDs results from 511307. See attached

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only. only LCS.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 1113N-SMB. All %Rs were in control.

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: All results were NDs.

Several samples had % moistures greater than 50%

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✓]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
11.3	judgement.	[✓]		

For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.

Note: R6AM1S R6AM2S

Herbicides All NDs All NDs

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 7

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SIIB04
Lab: STL - Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed.	H.T.
ICP	11/6,7/02	11/22/02	15,16 days
Hg	11/6,7/02	11/20/02	13,14 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?	✓						✓					
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Action:

	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: CRDL
As — / 75% Tl 78% / 76%
Fe 78% / —
Na — / 70%
Tl — / 139%

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓						✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓							✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		✓							✓			

Note:

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)												
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note: All Al, Ca, Fe, and Mg conc. in field samples were less than 1/2 of the conc. in ICSA. OK

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note: LCS/LCSD - for ICP all %Rs and RPDs were OK

LCS - Hg

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓							✓				
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.		✓						✓				
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note: MS/MSD – all RPDs were in control, except Ca RPD = 62.11 %, Mg RPD = 72.82 %.

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)		✓					✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD – non-client sample (48011-1, Zec16)

Mg MS = 326%

↳ not a client sample, OK.

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓											
10.2	Was a five-fold dilution performed?	✓											
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓										
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓									

Note: Serial Dilution – R6AU15 Ca %D = 12.5% J(+)

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓						✓					
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)		✓						✓				
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓						✓					
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: R6AM13/ R6AM23

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JB
Date:
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: S11B04
Test Name: TOC, pH, Grain Size
Method No.: 9060, 9045, ASTM D422

1.0 General: Chain-of-Custody/Data Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

	Date Collected	Date Analyzed	HT
pH	11/6/02	11/11/02	5 days
pH	11/7/02	11/13/02	6 days
TOC	11/6,7/02	11/15/02	8-9 days
Grain Size	11/6,7/02	11/27 - 12/16/02	21-39 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: TOC 11/15/12 ICal r = 0.99923
pH. 2.00, 4.00, 7.00, 10.00, 12.00. slope = 99.5.
ICV/CCV ok

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: TOC ICB/CCB All ND's. PBS-1 same as ICB.
pH none -

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: TOC LCS/LCSD 102%/106%.

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: TOC see LCS/LCSD. RPD is ok.

pH 48089-1 7.47/7.45 RPD = 0.27%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.		✓	

Notes:

	R6AM1S	R6AM2S	RPD
TOC	20,000	15,000	28.6%
pH	7.1	7.1	—

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 7			
10.1.2	Number of target compounds in each analysis: 2			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SIIB05

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).	✓	[ ]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
11/6/02	11/20/02	14 days
11/7/02	11/20/02	13 days
R5AD1WRE	11/22/02	15 days → J/UJ

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

MSP5973 11/11/02 2252 I. Cal
MSB5973 11/18/02 1101 I. Cal.
MSB5973 11/20/02 1254 QC samples, field samples.
MSB5973 11/21/02 1021 MS/MSD.
MSP5973 11/22/02 1014 RSADIWRE

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB - 1B1120 MB chloromethane 0.64 ug/L → Positive results 1.0 U,z

MB - 1B 1121 MB All NDs
MB - 1P 1122 MB All NDs

Trip Blank (8057A-4) All NDs
Trip Blank (8089A-6) chloromethane ~~0.51 ug/L~~ 1.0 U,z ok

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: MSP5973 11/12/02 chloromethane $r^2 = 0.9887$, 1,1,1-Trichloroethane $r^2 = 0.9854$
carbon tetrachloride $r^2 = 0.9866$, Bromodichloromethane $r^2 = 0.9871$
Bromomethane 22.0 %RSD. → These results were flagged previously due to holding time violation. ok
All $\overline{RRF} \geq 0.05$

R5AD1W-RE only

MSB5973 11/18/02 All %RSDs or r^2 were in control.
$\overline{RRF} \geq 0.05$

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

MSB5973 11/20/02 1323 Bromomethane -47.6%. ↓
RRF ≥ 0.05.
11/21/02 1152 All %Ds < 20%, RRF ≥ 0.05

MSP5973 11/22/02 1038 Bromomethane 117.1% ↑
chloroethane 27.1%. ↑
RRFs ≥ 0.05

→ 48089A-1RE
R5AD1W-RE

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note: MS/MSD - R6CM1W. All %Rs and RPDs were in control

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: LCS (IB1120MB) All %Rs were in control.

48089A MS/MSD → LCS/LCSD (IB1121MB) chloromethane 24%/24%, ↓ vinyl chloride 32%/34% ↓

Bromomethane 36%/— ↓

LCS/LCSD (IB1122MB). (A) ~~chloromethane~~ Chloroethane 6%/— ↓, Bromomethane —/200% ↑

→ ~~R5CM~~ R5ADIWRE Bromomethane RPD = 45%, ~~chloromethane~~ (B) RPD = 181%, ~~1,1,1-Dichloroethane~~ (B) RPD = 28%

1.2-dichloroethane RPD = 31% chloroethane . 1.1,1-Trichloroethane

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[ ]	✓	

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

R5ADIW	1.2-dichloroethane-d4	81413 ↓	(28.8%)
	1.4-difluorobenzene-	186436 ↓	(26.8%)
	chlorobenzene-d5	86319 ↓	(26.1%)
R5ADIWRE	All peak area were in control.		

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note: R5ADIW. Benzene 1.0 ug/L Toluene 0.79 ug/L ~~chlorobenzene 5.6 ug/L~~

$\frac{4678 \times 250}{186436 \times 1.9117 \times 5} = 1.05$ $\frac{2340 \times 250}{186436 \times 0.79405 \times 5} = 0.7903$ use linear regression

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: R6AM1W R6AM2W. — see next page

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 10

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

	R6AM1W	R6AM2W	Difference	RL
chloromethane	(DA) ~~0.50~~ 0.68	(DA) ~~0.68~~ 0.50	0.18	1.0
Benzene	0.35	0.21	0.14	↓
Toluene	0.45	1.0 U.	0.45	↓
Chlorobenzene	2.3	1.5	0.8	↓

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SIIB05

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: —

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/6/02	11/8/02	2 days	11/23/02	15 days.
11/7/02	11/11/02	4 days	11/23, 24/02	12-13 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSE 5973 11/22/02 1544 I. Cal / MB / LCS
11/23/02 1056) field samples
11/24/02 1218

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB-1108C-MB All NDs

MB-1111F-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[✓]	

Note: MSE5973 11/23/02 All %RSDs or r^2 were in control. RRF > 0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

MSE5973 11/23/02 1214 4-nitrophenol -24.7%. ↓

11/24/02 1233 1,2,4-Trichlorobenzene 20.5% ↑, 4-nitrophenol -22.7% ↓
Di-n-butylphthalate -26.2% ↓ Benzo(k)fluoranthene -21.5%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: LCS/LCSD - 1108C-MB. All %Rs and RPDs were OK

LCS/LCSD - 1111F-MB. All %Rs and RPDs were OK

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

		Yes	No	NA
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

		Yes	No	NA
10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		✓
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note: R6BU1W Phenol 1.0 ug/L. / N

$$\frac{9939 \times 40}{164676 \times 2.19928 \times 1.1} = 0.998 \text{ ug/L}$$

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: R6AMW R6AM2W

SVOCs ANDs ANDs

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		
14.1.1	Number of samples: 8			
14.1.2	Number of target compounds in each analysis: 65			
14.1.3	Number of results rejected and/or not reported: 0			

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%.

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SIIB05

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/6/02	11/8/02	2 days	11/11/02	3 days
11/7/02	11/11/02	4 days	11/12/02	1 day

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[ ]	✓
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]		✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

MB-1108R-JMB All NDs.

11110-MMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: SGLECD 11/7/02 All %RSDs or r^2 were in control on both columns.

SGMECD 11/7/02. All %RSDs or r^2 were in control on both columns.

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: SGIECD 11/7/12 0916

11/11/12 0989

SGMECD 11/7/12 1503

11/12/12 0931

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: SGIECD 11/11/02 1022 RTX CLP2 2,4-DCAA 23.4%

11/11/02 2238 RTX-CLP2 2,4-DCAA 20.9%

SGMECD 11/12/02 0984 RTX-CLP Methoxychlor -25.4%.
RTX-CLP2 Endrin aldehyde -18.0%.
2032 RTX-CLP 2,4-DCAA 16.7%
RTX-CLP2 All %Ds < 15%.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: LCS/LCSD 1108R-JMB All %Rs and RPDs were in control.

LCS/LCSD 1111O-MMB All %Rs and RPDs were in control

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns. All NDs	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note: All NDs in field samples

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note: R6AM1W R6AM2W
Pesticides All NDs All NDs

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: 8

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SIB05

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: —

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/6/02	11/12/02	6 days	11/18/02	6 days
11/7/02	11/12/02	5 days	11/18/02	6 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note: MSK5920 11/16/02 0532 I. cal.
11/18/02 0578 field samples

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: MB-1112C-MB All NDs

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[✓]	

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

MSK5972 All %RSDs < 20%.
11/16/02

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

MSK5970 11/18/02 0654 All %Ds < 20%

11/18/02 1708 All %Ds < 20%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		✓ (7A)
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		✓ (7A)
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	✓ (7A)

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	✓ (7A)

Note: MS/MSD - RS-AM3W (SIB06)

Hexachlorobiphenol 35%/34% ✓ (40-140%)

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: ~~Yes/Low~~ (A)
LCS All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[ ]	✓	

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:
R6AM(W) Phenanthrene-d10 87732 ↓ (57.1%)

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note: All NDs in field samples.

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note: R6AM1W R6AM2W

PCBs All NDs All NDs

14.0 Data Completeness

		Yes	No	NA
14.1	samples)	[✓]		

14.1.1 Number of samples: 8

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SIB05

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement?	[✓]		
	If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".			

Note:

Cooler Temp: —

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/6/02	11/8/02	2 days	11/14/02	6 days
11/7/02	11/12/02	5 days	11/14/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: MB-1108Q-SMB All NDs
MB-1112P-SMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: SGSECD 11/8/02 All %RSDs or r^2 were in control.

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: SGSECD 11/13/02 1038 All %Ds < 15% on both columns.
1909 2,4-DB -16.0% / -15.8%. ↓
11/14/02 1343 2,4-DB -21.4% / -19.3% ↓) J/UJ, L
11/15/02 0228 2,4-DB -22.4% / -16.5% ↓

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5 Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification. [✓]

Note: 48057A-1 82%/82%

$\frac{70753180}{427451509} = 0.165523/0.2 = 82.8\%$ $\frac{53555979}{320941263} = 0.166872/0.2 = 83.4\%$

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5 Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification. [✓]

Note: MS/MSD - R5AU1W (SIIB06) 2,4,5-TP MS = 105% ↑ (10-100%)
2,4,5-TP was not detected in associated samples
JR

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[ ]	✓	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.	✓	[ ]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: LCS/LCSD - 1108Q-SMB 2,4-DB RPD=44% ↑ (43%)
All %Rs were in control.
LCS - 1112P-SMB 2,4,5-TP LCS=108% ↑ (10-100%)
NDs in associated samples
JR

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns. All RPDs < 40%, JL	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note: R6ADIW. 2,4-D 1.3 ug/L JL R6AM2W 2,4-D 0.94 ug/L JL

SGSECD2 $\frac{20261377 \times 10 \times 1000}{314292141 \times 500} = 1.289$ ug/L SGSECD2 $\frac{14730482 \times 10 \times 1000}{314292141 \times 500} = 0.937$ ug/L

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✓]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
11.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note:

	R6AM1W	R6AM2W	Difference	RL
2,4-D	1.0	0.94	0.06 ug/L JL	0.5
Others	ND's	ND's		

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

12.1.1 Number of samples: 8

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SIIB05
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note:

	Date Collected	Date Analyzed.	H.T.
ICP	11/6,7/02	11/22/02	16, 15 days.
Hg	11/6,7/02	11/13/02	6-7 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis? All aqueous			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.		✓						✓				

	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: CRDL

Fe	138%/125%	Fe	—/131%	Al	—/122%	Tl	—/148%			
Pb	64%/60%	Se	123%/—	Pb	74%/—					
Se	145%/137%	Na	52%/—	Se	69%/128%	Hg	75%			
Na	—/75%			Tl	77%/129%					

→ 11/20-21/02 48057A 0.0050 ND due to blank contam

48057A-1F 20 mg/L J.W

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓						✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓							✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		✓						✓				

Note: _____

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		✓										
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓											
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)			✓									
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.		✓										

Note: _____

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.		✓						✓				

Note: _____

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.		✓						✓				

Note: MS/MSD - R6ADIW (ICP)
MS/MSD - Unknown ~~SEI~~ (ICP)
MS/MSD - R6AM1W Hg

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.) %R > 125% (120%) 30% < %R < 74% (79%) %R < 30% Positive J J J Non-detect None UJ R	✓							✓				
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.		✓						✓				

Note: MS/MSD - R6ADIW All %Rs and RPDs were ok - for ICP metals.
R6AM1W - Hg MS = 110% MSD = 125% ↑ (lab use 80-120,) J(+)
(*) all post-digestion spike recoveries were in control. J,m

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.		✓						✓				

Note: Serial Dilution (ICP) R6ADIW / R5ADIW
(Hg) R6AM1W

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓						✓					
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)		✓						✓				
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓						✓					
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: R6AMW/R6AMZW.

See attached

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 16												
12.1.2	Number of target compounds in each analysis: 23												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%.												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: JA
Date:
DV Level: II III IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: 5VB05
Test Name: Hardness as $CaCO_3$
Method No.: 130.2

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
10/6,7/02	11/11/02	4-5 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			✓
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			✓
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: standardization – use 1000 ppm $CaCO_3$.

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: MB - ND (<10)

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only LCS	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS = 100% 1000/1000 = 100%

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes: Lab dup R6CM1W 188/188 RPD = 0%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.		✓	

Notes: R6CM1W R6CM2W RPD

Hardness 188 208 10.1%

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes: R6A01W 200 mg/L/pp $\frac{1000 \text{ ppm} \times 5.00 \text{ ml}}{25 \text{ ml}} = 200 \text{ mg/L}$

R6AM1W 190 mg/L/pp $\frac{1000 \times 4.7}{25} = 188 \text{ mg/L}$

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 8			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 1/9/03
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: STB06

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 °C ± 2 °C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
11/8/02	11/20/02	12
11/9/02	"	11

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	JA
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			RA
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: Rinse blank R5BU4W Chloromethane 0.22 ug/L
toluene 0.7
1,2-dichloroethene 0.38
RB> R5BU4S
toluene 0.84 ug/L
POS<5X → 4X

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[ ]	✓	
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: see attached
IC 11/12/02 bromomethane %RSD 22.01 all ND, no flag
also several r <0.995 pos. J, r, UJ, r
ND

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

bromomethane MS 188 > 40-141 %.
" RPD 85 > 33
1,1,1-trichloroethane RPD 25% > 27%.
1,2-dichloroethane " 26% > 23%.
bromodichloromethane 33% > 28%.
cis-1,3-dichloropropene RPD 26% > 21%.

comment only

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: chloromethane LCS 146 > 34-145
bromomethane LCSD 194 ~~[illegible]~~ 40-141, RPD 108 > 33 all ND no flag
1,2-dichloroethane RPD 24 > 23 all ND no flag

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 1/8/03
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: S11B06

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/8/02	11/12/02	4	11/22/02	10
"	"	"	11/28/02	16
11/9/02	"	3	"	16

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[✓]	●
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		●
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[ ]	
5.4	verification.		[ ]	

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: See attached

all ND in ap. sample, no flags

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: RA
Date: 11/6/03
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: S11B06

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/5/02	11/12/02	4	11/14/02	2
11/9/02	"	3	"	"

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[✓]	
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[✓]		
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: See attached
endrin aldehyde, methoxychlor NDs → UJ in all samples.

no action 4,4-DDT since one column was good -

heptachlor epoxide %D = $\frac{\text{CCALRRF} - \text{avg RRF}}{\text{AVG RRF}} \times 100 = \frac{.726665 - .79266}{.79266} \times 100$
= 8.3% ✓

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

TCX	24%, 26%	R5AM0W3	all ND → UJs	unless prev. flagged
DCB	14%, 14%	R5AU1W	"	"
"	16%, 16%	R5CM1W	"	" "
"	8%, 8%	R5BU1W	all ND, RJs	
"	21%, 20%	R5BU4W	" UJs	unless prev.
"	" "	R5BM1W	"	"
"	13%, 12%	R5BU45	"	" "

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note: alpha-BHC MS = $\frac{0.068}{0.1}$ x 100 = 68% ✓

" MSD = $\frac{.063}{0.1}$ x 100 = 63%

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: beta-BHC LCS = .072/0.1 x 100 = 72%.

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note: _____

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[ ]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note: _____

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note: _____

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[ ]	✓	

14.1.1 Number of samples: 9

14.1.2 Number of target compounds in each analysis: 21

14.1.3 Number of results rejected and/or not reported: 21

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 88%

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 1/9/03
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: S11B06

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/8/02	11/12/02	4	11/18/02	6
"	"	"	11/12/02	9
11/9/02	"	3	11/20/02	8
"	"	"	11/12/02	9

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[ ]	✓

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: hexachlorobiphenyl MS/MSD 36/34% < 40-140%.

comment

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

		Yes	No	NA
10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[ ]	✓

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[ ]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]		

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: RIT
Date: 1/6/03
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: S11B06

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement?	[✓]		

If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).			[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/8/02	11/12/02	4	11/14/02	2
11/9/02	"	3	"	2
"	"	"	11/15/02	3

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[✓]	
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[✓]		
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	✓

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[ ]	✓

Note: CC 11/14/02 at 1343 2,4-DB (-21.4%) -19.3%)
" 11/15/02 " 0224 " (-22.4%) -14.5%) all ND → UJ/C

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	✓

Note: 214,5-TP MS 105% > 10-100% no action required
214,5-T MS%R = 4.4/4 x100 = 110%
" MSD%R = 4.14/4 x100 = 102%

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[ ]	✓	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	✓

Note: 214,5-TP LCS 108% > 10-100% all ND no flags
%R = 4.3/4 x100 = 107.5% = 108%

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	✓

Note: Dichloroprop (121.4%) R5A MIW
MCPP (47.5%) R5B MIW) J/J

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
11.3	judgement.	[ ]		

For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[√]		

12.1.1 Number of samples: _____

12.1.2 Number of target compounds in each analysis: _____

12.1.3 Number of results rejected and/or not reported: _____

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: S11B06
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 1/9/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓						✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓						✓				

Note: collected analyzed
11/8/9/02 11/23/24/02 ICP
" 11/15/02 Hg

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?			✓						✓			
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?			✓						✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%). Action: R(+/-) J(+)/UJ(-) J(+) R(+) Mercury < 65% 65% - 79% 121% - 135% > 135% Other Metals < 75% 75% - 89% 111% - 125% > 125%	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: several CRDL out see attached

Sodium 52% J, UJ, W

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓					

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓						✓					
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓						✓					
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note: several analytes in prep blank see attached <5x → U, P NDs UJ, P for As, TL, Hg POS J, P for Hg

all 75x ICB Mg, al, Ba, prev flagged for MS

CCB al, Ba, capper, Mn, V POS <5x → U, O

Rinse blank R5BU4W ca .016 mg/L R5BU4S ca .27 potassium .07

Mg .0065 Fe .033 Mg .068 <5x → U, x

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?	✓											
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS? Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)												
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓						✓					
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓						✓				
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓						✓			

Note:

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓						✓					
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓						✓			

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)	✓						✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note:

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓						✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).		✓					✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓						✓			

Note: aluminum 109% for total results, J's unless prev.

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?												
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)												
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.												
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: _____

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note: _____

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 1/9/03
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ✓ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: 311B06
Test Name: hardness as CaCO3
Method No.: 130.2

No flags

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler Temp:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	HT
11/8/02	11/15/02	7
11/19/02	"	6

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.			✓
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			✓
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?			✓
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: & Standardization was performed ✓

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?			✓
4.4	Do any field equipment blanks/trip blanks have positive results?		✓	
4.5	Are there field equipment blank/trip blanks associated with every sample?	✓		

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓
5.3	Was a field blank used for MS/MSD analyses?			✓
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?			✓

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?			✓

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples:_____			
10.1.2	Number of target compounds in each analysis:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			/
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			/
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			/
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			/

Notes:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: Misshadle
Date: Jan 29, 2003
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SII B07

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 ^{O}C $\pm$ 2 ^{O}C	14 days	14 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Analysed	HT
11/8/02	11/21/02	12 days
11/9/02		13 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected samples are rejected "R".			
3.3	Have ion abundance criteria for BFB been met for each instrument used?	[✓]		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

Method blank 11/21/02
acetone 3.7 ug/kg x 10 = 37 ug/kg - no associated samples.

Equipment blank - R5B445
- toluene 0.84 ug/L
- associated sample results "U,x" @ RL.

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).	✓	[ ]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	✓	[ ]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

CCV 11/20/02 @ 1748
acetone RRF 0.04418. Used ccal amt instead. No action taken.

CCV 11/21/02 @ 1055
bromomethane -21.6% ✓
acetone RRF 0.04639. Used ccal amt instead. No action taken.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[ ]	✓	

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: 2M1120LCS
chloroform 144% ↑ - all ND.

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 100%	Area < -50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

		Yes	No	NA
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

		Yes	No	NA
10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✗]	✓	
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		✗
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note: Sample R5AM3S was not adjusted - Wrong! @

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]	_____	_____

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: MSHadle
Date: Jan 29, 2003
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SII B07

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/8/02	11/14/02	6 days	11/20/02	6 days
11/9/02		5 days		

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[✓]	~~✓~~ NA
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		~~✓~~ NA
	Apply the 5X or 10X (for phthalates) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: MB 11/18/02

bis (2-ethylhexyl) phthalate 19 ug/kg
benzo(a) pyrene 22
indeno (1,2,3,-cd) pyrene 23
benzo(g,h,i) perylene 28

all associated were non-detect.

RESULTS ALL NDS

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Non-linear: J(+)/UJ(-) or professional judgement - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 80% R(+/-).			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? If yes, J(+)/UJ(-) or professional judgement - %D < 50%, J(+) only; %D >50%, but <80% J(+)/UJ(-); %D > 80% R(+/-).		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note: MS - 2-fluorobiphenyl 23%, terphenyl-d14 25% } QC sample.
MSD - " 26%, " " 26% }

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[ ]	✓	
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note:

1,3-dichlorobenzene	10%/13%	bis(2-chloroethoxy) methane	25%/27%	2-chloronaphthalene	22%/25%
1,2-dichlorobenzene	14%/16%	2,4-dichlorophenol	27%	acenaphthylene	25%/30%
2-methylphenol	30%/32%	naphthalene	19%/22%	dibenzofuran	25%/30%
hexachloroethane	8% (35%)	hexachlorobutadiene	15%/19%	fluorene	25%
2-nitrophenol	21%/25%	2-methylnaphthalene	20%/23%	dimethylphthalate	30%/32%
2,4-dimethylphenol	32%/32%	2,4,6-trichlorophenol	27%/32%	diethylphthalate	27%/27%

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 200%	Area < 50%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[✓]		
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]	____	____

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: Misshadle
Date: Jan 29, 2003
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SII B07

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/8/02	11/14/02	6 days	11/17/02	3 days
11/9/02		5 days		

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[✓]	
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[✓]		
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R (-)			
4.3	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[✓]		
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		

Note: _____

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
6.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-) or professional judgement.	✓	[ ]	
6.4	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note: CCV 11/17/02 @ 1643 CCV 11/18/02 @ 0134

4,4'-DDE -16.3% 4,4'-DDE -20.8%

4,4'-DDD -20.7% / -18.7% J/UJ 4,4'-DDD 16.1%

endrin aldehyde -16.3% ~~J/UJ~~ 4,4'-DDT -41.2% / -32.4% J/UJ

methoxychlor -28.0% / -32.0% J/UJ 2,4-DCAA 16.4% -Surr

2,4-DCAA 16.8% -Surr endrin aldehyde / -15.5% ~~J/UJ~~ ✓

~~4,4'-DDD / -18.7%~~

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		
	No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.			
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	>UCL	<LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

10.0 TCL Identification

		Yes	No	NA
10.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
10.2	Does the retention time (RRT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
10.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
11.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
11.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
11.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note: R5 AWIS
4,4'-DDT 59.2%

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for analysis?	[✓]		
12.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[✓]		

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-). If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).	[✓]		

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]	____	____

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: Mitchadle
Date: Jan 29, 2003
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SII307

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/8/02	11/14/02	6 days	11/25/02	11 days
11/9/02		5 days		

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[✓]		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	[✓]		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Note:

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results for PCBs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive PCB results?		[✓]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		✓
	Apply the 5X rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <20% for aqueous or %RSD <30% for soil?	[✓]		
	Linear — No flags			
	Non-linear — J(+)/UJ(-) or professional judgement.			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[✓]	

Note: * Per Method 680, the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[✓]	

Note:

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[✓]	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria? No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.	[✓]		
8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note:

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note:

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2	Are retention times of internal standards within ± 12 seconds of the associated calibration standard?	[✓]		

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3	Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification.		[✓]	

Note:

11.0 TCL Identification

		Yes	No	NA
11.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	[✓]		
	Are all ions present in the standard mass spectrum, at a relative intensity greater than 10%, also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 20%?	[✓]		

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]		✓
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for PCB analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limit? (95% for aqueous samples and 90% for soil samples)	[✓]	____	____

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: _____

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: Musshadle
Date: Jan 29, 2003
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SIIB07

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp:

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

		Yes	No	NA
2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
11/8/02	11/22/02	14 days	11/25/02	3 days
11/9/02	11/13/02	13 days	11/16/02	
		5 days		
		4 days		

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines		[✓]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[✓]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[✓]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

5.0 Continuing Calibration

		Yes	No	NA
5.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Has a continuing calibration standard been analyzed at the beginning of each day, every 10 samples, and at the end of the run?	[✓]		
5.3	Do any compounds have a % difference (%D) values between initial and continuing calibration RRF outside QC limits (%D < 15%)? If yes, J(+)/UJ(-)	✓	[ ]	
5.4	verification.		[✓]	

Note: CCV 11/15/02 @ 1726 CCV 11/05/02 @ 1945
2,4-DB -20.5%/ 2,4-DB 16.4%/

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: _____

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[✓]	

Note: _____

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	[✓]		
8.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all LCS %Rs within acceptance criteria? For %R> UCL, J(+) only. For %R < LCL, J(+)/R(-).	[✓]		
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		[✓]	
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[✓]	

Note: _____

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]	✓	
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	

Note: R5A415
2,4-D 64.7%

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[✓]		
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		
11.3	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		

Note:

12.0 Data Completeness

		Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	[✓]	____	____

12.1.1 Number of samples: _____

12.1.2 Number of target compounds in each analysis: _____

12.1.3 Number of results rejected and/or not reported: _____

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = _____

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

Project Name: Sauget Area II
Reviewer: Mitshadle
Date: Jan 29, 2003

SDG No.: SII B07
Lab: STL Savannah

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓					✓	✓					✓
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓						✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓						✓				
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C ± 2 °C)	✓						✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓						✓					

Note:

2.0 Holding Time

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months; cyanide: 14 dats) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓				✓		✓				✓

Note: Date Sampled Date Analyzed

11/9/02 11/24/02 15 days, 16 days
11/8/02 11/14/02 5 days, 6 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓					✓	✓					✓
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis?	✓						✓					
3.3	Were all dilution reflected in the positive detections and detection limits?	✓						✓					
3.4	Was the MSA used when the serial dilution or matrix spike displayed unacceptable results?	✓								✓			

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓					✓	✓					✓
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7.	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓						✓					
4.8	Was the CRA run after the ICV at the beginning of the run?	✓						✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Action:	R(+/-)	J(+)/UJ(-)	J(+)	R(+)
Mercury	< 65%	65% - 79%	121% - 135%	> 135%
Other Metals	< 75%	75% - 89%	111% - 125%	> 125%

Note: CRDL
Thallium 72%/72%
Pb /132%
Os /123%

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓					✓	✓					✓
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓					
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓							✓				

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓					✓		✓				✓
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓					↓		✓				↓
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓		✗			↓	✓		✗			↓
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓			↓			✓			↓

Note: Prep Blank (mg/kg)
Al -1.37365, Cu 0.16651, Mg 0.6805
Ba 0.12884, Fe 2.59891, K 4.12669
Cr 0.15486, Pb 0.2132, Tl -0.63588

ICV
Tl -0.00734

CCB5
Al -0.02736, Fe 0.02684
Ba 0.00223, Mn 0.00264
Cd 0.00038, Ni 0.00232
Cr 0.00255, V 0.00257
Co 0.00069
Cu 0.00392

Hg- Prep Blank
0.0028 mg/kg

CCB6
Al -0.04378, Mn 0.00208
Ba 0.00208, Ni 0.00215
Cr 0.00174, V 0.00126
Cu 0.0036

6.0 ICP Interference Check Sample (ICS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICSA and ICSAB analyzed at beginning and end of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	✓					✓						
6.2	Are the ICS AB recoveries within 80% - 120%?	✓					↓						
6.3	Are the results for unspiked analytes (in ICS A) < ± MDL?	✓					↓						
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			↓						
	Action: Not Spiked Analytes: < -IDL UJ(-); > IDL J(+). Spiked analytes (ICS AB analytes): < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)						↓						
6.5	Were any transcription/calculation errors noted in the ICS data? Level IV only.			✓			↓						

Note: _____

7.0 Laboratory Control Sample (LCS)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓					✓	✓					✓
7.2	Is any LCS recovery outside the control limits? (Aqueousand soil limits: 75 - 125% (80% - 120% for copper and mercury). Action: Aqueous/Soil: < 50% R(+/-); 50% - LCL% J(+)/UJ(-); > UCL% J(+)		✓				↓		✓				↓
7.3	Were any transcription/calculation errors noted in the LCS data? Level IV only.			✓			↓			✓			↓

Note: _____

8.0 Laboratory Duplicates

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	✓					✓	✓					✓
8.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		✓						✓				
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± RL for aqueous, and RPD < 35% or difference < ± 2 X RL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X RL.	✓						✓					
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.			✓			✓			✓			✓

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓					✓	✓					✓
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.) %R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%; Positive: J / J / J; Non-detect: None / UJ / R		✓					✓					
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓			✓			✓			✓

Note: Sb 74% / 74% Fe -2% / 6254% (-44%) Zn 156% → %RPD (58.96%)
Al 284% / 228% Pb -13% / -28% Cu / 132%
Ca -1032% / -2431% Mn 72% / [redacted] Mg / 65%
Cr 159% / 143% Ag 71% / 67%
} not client sample.

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					✓	✓					
10.2	Was a five-fold dilution performed?	✓						✓					
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the original sample? If no, J(+).	✓						✓					
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓			✓			✓			

Note:

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓					✓						✓
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)												
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.												
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note: _____

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓					✓	✓					✓
12.1.1	Number of samples: _____												
12.1.2	Number of target compounds in each analysis: _____												
12.1.3	Number of results rejected and/or not reported: _____												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = _____												

Note: _____

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: Mitthadle
Date: Jan 29, 2003
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SIIB07
Test Name: Wet Chemistry
Method No.:

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler Temp:

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:	Date Collected	Date Analyzed	HT
	11/8/02	11/18	
	11/9/02	11/13	

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculationerrors noted in the calibration verificationdata? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes:

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within control limits?	✓		
7.4	Were there any transcription /calculation errors?		✓	

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.		✓	

Notes: