		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: 9/16/02
Lab: STL

Project Name: Sausget Area II
Project Number: 21560888.0005
SDG No.: SA1117

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:

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:

Collect.	Extract.	Analyzed
7/11/02	7/18/02	7/29/02, 7/31/02
7/12/02	"	" , 7/30/02

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.	[ ]	✓	

	> 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:

WASTE -R-4-COMP-T 5x ⇒ diluted out J→UJ/S
WASTE-R-3-22 FT 5x ↳ ↳
WASTE-R-2-COMP-T 25x = OK ✓ no flag >10x
WASTE-R-1-COMP-T 10x 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:

LCS/LCSD results 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:

.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:

2.0 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: Several compds exceeded calib "E" by lab → J/g
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:

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: 9/10/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SAII17

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:

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:

	collect.	extract.	analyzed
	7/11/02	7/12/02 7/18/02	7/22/02
Soil	7/12/02	7/26/02	8/2/02

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: 7/22/02 1436 conf. methoxychlor 38.1, ND no flag
" 2019 " " 43.4 " "
8/2/02 1517 primary " 25.8, conf. 20.6
8/3/02 0038 " endrin 16, methoxychlor 44.7 } Pos. methox. J, C, endrin UJ, C in
" conf. " 17, " 42 } WASTE-R-4-COMP-T

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: ~~2,4-DCAA 18, 16% < 30-150 in WASTE-R-2-COMP-T UJ, S~~
~~" 18, 20% in WASTE-R-1-COMP-T UJ, S~~
diluted out in ~~WASTE-R-4-COMP-T DF=2~~ UJ, S unless prev. flagged
2,4-DCAA 28, 480%, tetrachloro-m-xylene 25%, in ~~WASTE-R-3-22FT~~ J, 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 results 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: methoxychlor 66.7 in WASTE-R-4-COMP-T
heptachlor 60% in WASTE-R-3-22FT) prev. flagged.
no more action

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: RA
Date: 9/16/02
Lab: STL

Project Name: SAII
Project Number:
SDG No.: SA1117

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:

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:

collect.	extract.	analyzed
7/11/12/02	7/18/02	7/23/24/02

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 analyzed 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: 9/17/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA1117

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:

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:

	collect.	extract.	analyzed
soil	7/11/02	7/19/02	8/2/02
	7/12/02	"	7/25/02 8/2/02

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: 8/2/02 1242 Primary column 2,4-D 16.7.
pos. TIC in all. 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: 2/4-DCAA % in WASTE-R-4-COMP-T J, R, S
diluted out in WASTE-R-3-22F-T J, UJ, S unless prev. flagged
DF=5 " " in WASTE-R-2-COMP-T, WASTE-R-1-COMP-T, no action since 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: 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: 2,4-D 42.4% in WASTE-R-3-22FT Prev. flagged for calib. failure ✓

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: 4

12.1.2 Number of target compounds in each analysis: 2

12.1.3 Number of results rejected and/or not reported: 1

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

% Completeness = 87% <90%

Note:

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

SDG No.: SA1117
Lab: STL

Project Name: Sauget Area II
Reviewer: RA
Date: 9/17/02

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
7/11/12/02 7/17/25/02 ICP
" 8/1/02 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: As CRDL 79%. Slightly <80% 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: ccB lead 0.00162 mg/L
Cr 0.00197 " all 75x blank, 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%) / 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:

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

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII18

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. 1.2°C - 5.7°C

only waste sample data provided in this SDG, ok

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 Analyzed	H.T.
7/11/02	7/22,23,25/02	11-14 days.
7/12/02	7/22,23,25/02	10-13 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: 7/11/02 0857 I. Cal.
MS05973 7/22/02 0853
7/23/02 0827. } field samples, QC
7/25/02 1584

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: 10ϕ722MB - (Med-level) All NDs.
10ϕ723MB (Med-level) chloromethane 84 ug/kg. ↳ U.z at RL Ethyl Benzene 27 ug/kg. ↳ results > action level, QC.
20ϕ725MB - (Med-level) All NDs.
⊕ The methanol preserved samples were possibly contaminated with methylene chloride. and all samples were re-analyzed from bulk containers for confirmation. ctrle results from re-analyzed samples should be used.

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 (MSD 5973) 7/11/02 Acetone $\overline{RRF}$ = 0.0487.
All %RSDs or r^2 were in control.
Acetone results. J.c/~~[illegible]~~ R.c
JB

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. 7/22/02 0945 1,1-dichloroethane 31.4%, Acetone RRF = 0.04156
7/23/02 1006 Acetone RRF = 0.04198
7/25/02 1617 Acetone RRF = 0.04167 2-Hexanone -20.7%

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.) 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: Surrogates were all diluted out. (DF = 400 ~ 5000) 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?	[ ]		✓
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 - 10Ø722MB 1.1-dichloroethane 132% ↑ (51-129%)
LCS - 10Ø723MB 1.1-dichloroethane 132% ↑ — WASTE-R-1-19FT J.1
LCS - 20Ø725MB 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: 44968C-3. WASTE-R-1-19FT.

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: SAUG&T Area II
Project Number:
SDG No.: SAII18

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: 1.2°C - 5.7°C
Only waste samples were reported.

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.	H.T	Date Analyzed.	H.T.
7/11/02	7/19, 22/02	8-11 days.	7/30, 8/5, 8/7	11 - 19 days.
7/12/02	7/19/02	7 days	7/30/02	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 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: 7/12/02 1605, 7/20/02 0819, 8/2/02 1645 J. Cal
7/22/02 0624, 7/29/02 0813, 7/29/02 2031, 8/5/02 0907, 8/7/02 0729

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-071913-3MB 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: 7/12/02, 7/20/02, 8/2/02 — 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:
C. Cal 7/22/02 0704 All %Ds < 20%
7/22/02 0738 %D < 20%
7/29/02 0829, 0906 All %Ds < 20%.
7/29/02 2152, 2220. All %Ds < 20%
All RRFs > 0.05
8/5/02 1015 2,4-dinitrophenol −33.3%, 2,4-dinitrotoluene −20.5%
4,6-dinitro-2-methylphenol −26.0%
449680-20LRB
1044 Dinoseb −24.8%. ⊛ these results were not used for data interpretation. ok
8/7/02 0746, 0816 – 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: Surrogates were all diluted out! (DF=10 - 500)

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 - 071913-EMB — 7/22/02 — N-nitrosodiphenylamine 48%/48% ↓ (51-132%)
Butylbenzylphthalate 54%/54% ↓ (58-122%)
LCS-07198-2MBRE — 7/29/02 — N-nitrosodiphenylamine 48% ↓
Chrysene 54% ↓ (56-133%)
LCSD recoveries 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).

		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:

44968C-2DL — Perylene-d12 — 357503 (423128-1892510) — 42.2%
44968C-2DLRE — Chrysene-d12 — ~~333314~~ 326198 (333314-1333256) — 48.9%

1) Since only 2,4-dichlorophenol was used for data interpretation
2) this compound was not associated with these two IS. JK.

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: 6

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

% Completeness = ~~100%~~ 97.7%

JA

Note:

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

Reviewer: JA
Date:
Lab: SFL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII18

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: 1.2 - 5.7°C

Only Waste samples in this SDG

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	H.T	Date Analyzed.	H.T.
7/11,12/02	7/19/02	7-8 days	8/6,2/02	14, 18 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?		[✓]	✓ (28)
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-07190-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 7/25/02 All %RSDs or r^2 were in control.

8/5/02 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: 7/25/02 1321
8/2/02 1357
8/5/02 1019
8/6/02 1403
} All %B 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. 8/2/02 1517 RTX-CLP Methoxychlor 25.8%, TCMX -16.2%
RTX-CLP2 4,4'-DDT 18.5% Methoxychlor 20.6%
449~~68~~C-2 8/3/02 0038 RTX-CLP Endrin 16.0%, 4,4'-DDT 19.8%, Methoxychlor 44.7%
450~~05~~C-3 Endrin ketone 19.1%, 2,4-DCAA -19.5%, TCMX -15.5%
RTX-CLP2 Heptachlor 18.6%, Dieldrin 16.0%, Endrin 17.0%
4,4'-DDD 19.7%, 4,4'-DDT 26.1%, Endosulfan sulfate 19.7%
Methoxychlor 42.0%, Endrin ketone 21.3%, 2,4-DCAA -15.8%
450~~05~~C-1 8/6/02 1428 RTX-CLP - All %Ds < 15%
449~~68~~C-1 RTX-CLP2 - TCMX 12.6%

7.0 Surrogate Recovery

8/7/02 0236 RTX-CLP Aldrin 15.7% (A) Aldrin - ND in associated sample. JK.
RTX-CLP2 TCMX -19.3%.

		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. (DF = 100-200) 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?	[ ]	✓	
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 - WASTE-R-4-COMP - the MS and MSD were analyzed at a dilution of 100. Due to the level of dilution required, spiking compounds were not recovered.

9.0 Laboratory Control Sample (LCS)

Summary form was not provided

		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 - 07190-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: Most of positive detections RPD > 40%.

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: 4

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:
SDG No.: SAII18

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. 1.2°C - 5.7°C
only waste sample 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.	H.T.	Date Analyzed.	H.T.
7/11/02	7/19/02	8 days	8/8/02	20 days
7/12/02	7/19/02	7 days	8/8/02	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: 7/26/02 0547 I. Cal.
7/31/02 0456 — QC
8/8/02 0818. — 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 - 0719A - 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. 7/26/02 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: C. Cal 7/31/02 0557, 1522) All %Ds < 20%

8/8/02 0926, 1610.) All %Ds < 30% (OK for soil/waste samples)

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: Surrogates were diluted out. (DF=10-100) /

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 - 44926A-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 - 0179A-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).

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: 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: _____

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:
SDG No.: SAII18

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 1.2°C – 5.7°C
only Waste samples in this SDG.

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.	H.T.	Date Analyzed.	H.T.
7/11, 12/12	7/22/12	10-11 days.	8/8, 13/12	17, 22 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 - 0722N-SMB. 2,4-D 4.7 ug/kg $\xrightarrow{\times 5}$ 23.5 ug/kg → results > action level, ok
PCP 1.8 ug/kg. $\xrightarrow{\times 5}$ 8 ug/kg. — U, 2 at 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 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 7/22/02 All %RSDs or r^2 were in control.
8/4-5/02 All %RSDs or r^2 were in control.
8/9/02 All %RSDs or r^2 were in control.

5.0 Continuing Calibration

C. Cal. 8/13/02 1601 MCPP 17.1%, 24-DB 18.2% — DB-XLB
45605C-102 → 2,4-DB 20.7% — DB-35MS.

		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: 8/1/02 2238 DB-35MS 2,4-DB -19.8%
8/2/02 1242 DB-XLB MCPP 19.4%, 2,4-D 16.7%, PCP 15.5%
8/8/02 1037 DB-XLB Dalapon 22.3%, MCPP 18.6%
DB-35MS Dalapon 17.6%, MCPP 19.3%
All field samples. 8/8/02 2018 DB-XLB Dalapon 20.5%, MCPP 23.1%, MCPA 18.4% ~~Dinoseb 17.3%~~
DB-35MS Dalapon 19.1%, MCPP 24.4%

ND in associated samples, UJ

7A

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: Surrogates were diluted out, (DF = 20 - 4000) /ok

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. - WASTE-R-3-22FT. the MS/MSD were analyzed at a dilution of 500. spiking compounds were diluted out. 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 - 0722N-SMB - 2,4-D 172% ↑ (19-153%) LCS use MBS and spiking — contamination for 2,4-D

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: 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.: SAII18
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 1.2°C - 5.7°C, only waste samples were reported in this SDG.

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	7/11, 12/02	7/27/02		
Hg	7/11, 12/02	8/11/02	30-31 days	WASTE-R-2-COMP, WASTE-R-3-22FT — J/UJ, h
		8/6/02	25, 26 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: Hg analysis - Sample S245005C-3 did not meet the 85-115% post-digest spike criteria (73%). Therefore, the sample was analyzed by MSA.

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.							Hg r=0.999985					
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: CRDL.
Tl initial 134% ↑
Al initial 124% ↑
Pb Final 78% ↓
Se initial 74% ↓ final 125%.
Na final 78% ↓
Hg 79% 65%.) J.h due to holding time violation.

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: Hg results in associated samples > 5X blank conc. (negative) ok.
ICP blank conc. — 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: ⊗ Cd results → J.p due to method blank contamination. — 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:

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 – Soil-R-3-6FT. No lab dup – see MS/MSD.
Sb RPD = 26.29%, Ca RPD = 28.85%.
Pb RPD = 32.0%, Mg RPD = 40.4%.
~~Mg~~ Mn RPD = 25.6%, Zn RPD = 45.4%. J.d.

(7A)

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%)		J										
	30% < %R < 74% (79%)		J										
	%R < 30%		J										
	Positive												
	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-R-3-6FT (In SDG SAII16)
Sb MS = 61%, Pb MS = 205%, Mg MS = 413%, MSD = 142%, J.m
K MS = 128%, MSD = 150%, Na MS = 127%, V MS = 132%
result use MSA

10.0 ICP Serial Dilutions

Post-digestion Spike – WASTE-R-1-COMP All %Rs over ok
Hg – Waste-R-3-22FT 73%

		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 WASTE-R-1-COMP All %Ds < 10%

Hg – WASTE-R-1-COMP %D = 12.9%, ok Hg conc < 80x MDL
WASTE-R-3-22FT %D = 27.1% → ~~J.de~~ J.h due to holding time violation, ok

(7A)

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: RA
Date: 9/18/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA119

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:

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:

collect.	analyzed
7/12/02	7/18/02, 7/22/02
7/15/02	7/18/02, 7/19/02

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-7115102 acetone 11 ug/L <10x
Tetrachloroethene 0.5 <5x > U, ug 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 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.
pos. J, C, ND, R/C unless prev. flagged.

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 7/18/02 acetone RRF 0.0487 %D 21.9 prev. flagged due to ical.
1,1-Dichloroethane 34.5 %D no pos. no flag
CC 7/19/02
acetone RRF 0.0469 prev. flagged
CC 7/22/02 acetone RRF 0.04156 prev. flagged
1,1-Dichloroethane 31.4 %D no pos. 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 142% > 51-140

RPD { VC 41 > 21%
1,1-Dichloroethane 31 > 30%
Carbon disulfide 36 > 23%

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 > 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: GW-AA-S-1-114 Chlorobenzene E → Jq
use Diluted result DF=5

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: 11

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 11

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

% Completeness = 96.9%

Note:

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

Reviewer: RA
Date: 9/18/02
Lab: STL

Project Name: Sangat Area II
Project Number:
SDG No.: SA1119

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:

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:

collect.	extract.	analyzed
7/12/02	7/18/02	8/1/02
7/15/02	"	"

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: IC 7/31/02 2,4-dinitrophenol 0.987
UJ/R in all 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 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 7/31/02
2,4-dinitrophenol 28.2% D
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? 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 > 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:

.1.0 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: NO "R" Flags

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

Reviewer: RA
Date: 9/18/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA119

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:

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:

collect.	extract -	analyzed
7/12/02	7/17/02	7/22/02
7/15/02	"	"

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:

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 24% > 28% in GW-AA-S-1-104, GW-AA-S-1-104 all ND → UJ,S
" 24% > 24% in GW-AA-S-1-124 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: _____

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: RA
Date: 9/18/02
Lab: STL

Project Name: Sunset area II
Project Number: 21560888.6006
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:

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:

collect.	extract.	analyzed
7/12/02	7/18/02	7/23/02
7/15/02	"	"

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

Note: 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

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

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.

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: NO R flags

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

Reviewer: RA
Date: 9/18/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA1119

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:

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:

Collected	extract.	analyzed
7/12/02	7/17/02	7/25/02
7/15/02	"	"

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 → 2,4-D .39 ug/L
2,4,5-T .16 } all ND
Pentachlorophenol .64 U,Z at 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 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 7/25/02 0743
Primary column 16.9 % Pentachlorophenol
No action since other column was good.
and ND's

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:

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.: SA1149
Lab: STL

Project Name: Sauget Area II
Reviewer: RA
Date: 9/18/02

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 7/12/02 analyzed 7/26/02 ICP, 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: aluminum initial CRDL 124%
lead final " 78%
Se initial 74, final 125
Sodium final 78%
) no action comment

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.	✓						✓					

al MB → 0.04241 mg/L <5 → U/P at RL
0.040
cu ↓ 0.00097 mg/L <5 → U/P at RL

MB → Se — 0.00597 J/UJ/P
MB → Tl 0.00396 all ND, 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: CCBs pos. al, as, ba, cu, mn, TL, V pos <5x U,0 at RL

CCB neg. Magnesium 75x, no action

one CCB → neg. for Hg → UJ,0

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: zinc 17.3% → 715 in all

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: 8/16/02
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 area II
Project Number:
Laboratory: STL
SDG No.: SA1119
Test Name: methane
Method No.: 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:

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	analyzed
7/12/02	7/23/02
7/15/02	"

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: r<0.990 at 0.986 POS. J,r in all –

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: 9/18/02
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 II
Project Number:
Laboratory: STL
SDG No.: SA1119
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	analyzed	
7/12/02	7/14/02	NO3, CO2
"	7/18/02	SO4, 7/23/02 alkalinity
7/15/02	7/16/02	NO3, CO2
"	7/23/02	SO4, alkali

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: 10/4/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA1120

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:

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:
collect - analyzed
7/16/02 7/24/02
7/17/02 "

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 chloromethane .39 ug/L U,z or U,z at RL
TB-7-16-02 chloromethane 0.4 prev. flagged
vinyl chloride 0.28
1,1-dichloroethene 0.4
carbon disulfide .28
trichloroethene .46
toluene .42
1,2-dichloroethane .38

U,y or U,y 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 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:

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: RPD Vinyl Chloride 29% 72%. 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 > 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 "E" in several → J/q
use DF=2 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	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:

AA-Q-1-60		RL	-60 DUP	
chloroethane	.79	1	.89 ✓	
acetone	16	1	25 U	ok ✓ |16| < 25 ✓
carbondisulfide	~~0.52~~ J,P		10 U	|12.5| > 2 → J,P
~~1,1-DCA~~	~~4.9~~		~~3.80 U~~	
chlorobenzene	260		240	RPD = 8%

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: 10/4/02
Lab: STL

Project Name: Sanget
Project Number:
SDG No.: SA1120

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:

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:

collected	extracted	analyzed	
7/17/02	7/23/02	8/1/02	8/6/02
7/16/02	7/19/02	7/27/02	7/31/02

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 8/1/02 Pos. results for 31 compds. The only pos. was 1,2-dichlorobenzene U,Z at RL in GW-AA-Q-1-90, GW-AA-Q-1-100

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: 7/31/02 2,4-dinitrophenol 0.987
all ND, UJ, rin ans.

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: Several %D > 20%. see attached
all <50%, no pos, 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: Terphenyl-d14 13% 14-148 in the MS Sample. QC, no action ✓

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: benzo (b) fluoranthene RPD 38% 732- LCS
POS. → J, d- in GW-AA-Q-1-80

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:

	AA-Q-1-60	RL	AA-Q-1-60DUP	RPD	
2-Chlorophenol	2.9	10	3	OK✓	
1,4-Dichlorobenzene	21	10	20	✓	
1,2- " "	8	10	8	✓	
4-chloroaniline	60	20	80		28% OK
1,3-dichlorobenzene	60 U	10	3	OK✓	

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: No "R" ✓

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

Reviewer: RA
Date: 10/4/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA1120

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:

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:

collect-	extract	analyzed
7/16/02	7/19/02	7/30/02
7/17/02	7/23/02	7/30/02

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: 7/30/02 1733
Primary alpha-BHC -17 > 4,4-DDE -26

7/30/02, 2344 alpha-BHC -17.6
DDE > -31.6 NO POS.
DDD -15.6. no flag

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: GW-AA-Q-1-80 decachlorobiphenyl 19% > 20% < 30-150 J, UJ, S
GW-AA-S 2-118 1/2 " 24% > 24% < — J, UJ, S

MB → TCX 18%
LCS TCX (tetrachloro-m-xylene) 17%) QC no action

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 - see below

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: RPD > QC for alpha-Chlordane 20%, 4,4-DDE 22%, 4,4-DDT 28%. No pos., no action

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: gamma-BHC, heptachlor in GW-AA-Q-1-80 >40%.
beta-BHC in GW-AA-S-2-118 1/2
prev. due to sur.
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: _____

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: 10/4/02
Lab: STL

Project Name: Sauget
Project Number:
SDG No.: SA1120

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:

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:

collect-	Extract-	analyzed
7/16/02	7/18/02	7/24/02
7/17/02	7/24/02	7/26/02

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: 10/4/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA120

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:

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:

Collect -	extract	analyzed
7/16/02	7/23/02	8/4/02
7/17/02	"	"

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 → 2,4-D 3.7 ug/L NO POS. ✓
pentachlorophenol 0.2 ug/L U,Z at RL in GW-AA-Q-1-80

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 -
no pos - ok on one column, no flags

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: as per narrative, it was cancelled by client

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: 2,4-D 2% < 11-154%. all ND → R, J

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: Pentachlorophenol in GW-AA-Q-1-80 Prev. due to MB
64.5

2,4,5-TP (75.9) in GW-AA-S-2-118/12 → 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: 3

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 3

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

% Completeness = 90% <95%

Note: comment

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

SDG No.: SA1120
Lab: STL

Project Name: Sauget Area II
Reviewer: RA
Date: 10/4/02

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: collect. analyzed
7/16,17/02 7/31/02, 8/2/02 ICP
" 8/1/02 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 CRDL at 135%, thallium 68%.
Final 4 iron 69%, Se 72%. not serious no action
Sodium 69%.

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, cal, copper, neg. arsenic, potassium, thallium, ~~pos. U, P at RL~~, <5x ↓ U, P at RL → J, UJ, P
~~EB pos → Al, all U, P, neg. Arsenic prev. flagged for Prep blank~~
~~pos. Ba~~ ICB, CCB, pos. al, ba, copper, mn, Tl, V and neg. arsenic at low levels - potassium
all yes x → 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 in ICSA solutions - Al, Ca, Fe, Mg in all samples < [redacted] 1/2 ICSA - no action ✓

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:

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: 10/4/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP

Project Name: Sunset
Project Number:
Laboratory: STL
SDG No.: SA1120
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:

collect -	analyzed
7/16/02	7/23/02
7/17/02	7/31/02

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 R^2 <0.990 at 0.987 pos → J/r in all

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:

.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:

.0.0 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: 10/4/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846
___ NJDEP/SW-846
___ NFG/CLP
___ Project QAPP/SAP
___ Region III/SW-846

Project Name: Sunset
Project Number:
Laboratory: STL
SDG No.: SA1120
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	analyzed
7/16/02	7/18, 23, 25/02
7/17/02	7/19, 23, 25/02

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: RA
Date: 10/7/02
Lab: STL

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA1121

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
[redacted]		
7/16/17/02	7/29/02	13/12

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 >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: CC 7/29/02
2-butanone %D 33.1% → J,C in WASTE-P-1-15.

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.)	[ ]		

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-butanone MS 168% > 42-167%
RPD 40% > 31%
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: 2-butanone 176% > 42-167%. Pos. prev. flagged for calib - no more ✓

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: 10/7/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA1120

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
collect -	extract	↓	analyzed	↓
7/16/02	7/23/02	7	7/30/02	7
7/17/02	5	6	5	7

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.	[ ]		

	> 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 > 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	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: 10/7/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA1121

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
7/16/02	7/23/02	7	7/26/02	3
7/17/02	"	6	7/26/02	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: CC 7/26/02 at 2120
Primary heptachlor 21.5%,
Conf. methoxychlor 22.9%
no pos., 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

1 comment

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

Note: Fluid blank → DCAA 22%, TCX (27%, 26%) < 30-150
LCS DCAA 27%, LCSD DCAA 25%
WASTE-P-4-COMP-T DCAA 26%
QC - no action
DCAA experimental - does not affect - no mention
WASTE-P-3-COMP-T DCB 29% no action for one sur-
comment

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: _____

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: RA
Date: 10/7/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA112

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

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

Note:

Date Collected	Date Extracted	HT	Soil or W	Date Analyzed	HT
~~[illegible]~~ -	extract			analyzed	
7/16/02	7/24/02	8		7/29/02	5
7/17/02	"	7		"	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: 10/7/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA112

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(-).		[✓]	
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
		SOIL			
7/16/02	7/24/02	~~8~~	OK	7/27/02	3
7/17/02	"	7		7/27/02	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: FLUID BLANK 2,4-D 0.018 mg/L

POS. U,Z at RL in WASTE-P-1-COMP-T
WASTE-P-3-COMP-T

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:

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:

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.: SA1121
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 10/7/02

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
7/10/17/02 7/25,26/02 ICP
" 8/2/02 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 CRDL. arsenic 59%, lead 128%. as → J/UJ/W
no flags for others, not serious enough
Final lead 124%.

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%) / 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: _____

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

Reviewer: RA
Date: 9/19/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA1122

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:

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: Soil collected 7/16/02, 7/17/02 analyzed 7/18/02, 7/22/02, 7/25/02, 7/22/02

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: 1MØ722MB → 2-butanone 1.8, 4-methyl-2-Pentanone 0.62,
xs = 18 xs = 3.1
2-hexanone 1.9 ug/kg
xs = 9.5 Pos. → U,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 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 7/3/02 carbon disulfide 0.967, J, UJ, r

IC 7/11/02 acetone RRF 0.0428 pos. J, C, ND, R, C

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 7/22/02 0945 acetone RRF 0.04156
" 7/23/02 " " 0.0467 prev. due to ical
" 7/25/02 " " 0.04167

pos. J, C unless prev.

CC 7/22/02 1134 MCl_3 43 %D
" 0945 1,1-dichloroethane 31.4
7/23/02 " 49.8, 1,2-dichloroethane 32.4
7/25/02 2-hexanone 20.7
7/18/02 acetone 40.6

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: bromofluorobenzene < QC (63 - 135) in
SOIL - P - 3 - 0.5 62%
SOIL - Q - 5 - 0.5 52%
SOIL - Q - 5 - 0.5 RE 48%
} J/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 - see below -

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: 111- dichloroethane 132 > 51-129 Med- all ND, no action

Low → RPD > QC acetone 32, MCl3 44, 2-hexanone 47%. pos J & unless prev. flagged

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: SOIL-P-1-0.5 1,4-difluorobenzene (33%), chlorobenzene (19%) use original
RE, 40%, 42%, 26% J, UJ, n
SOIL-P-3-0.5 24% - prev. flagged for sur. no more -
SOIL-P-3-0.5RE 43%, chlorobenzene = 30% → J, UJ, n use re-analysis -
SOIL-Q-5-0.5 23%, 11% prev. flags. Sur - use original
RE acc is < QC → prev. flaged sur.
SOIL-P-3-6 42%,
Chlorobenzene = 34% → J, UJ, n unless prev. flagged -

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: Several exceeded in SOIL – P-3-6 → J.q unless prev. flagged. re-analyzed – use results from re-analyzed –

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: 16

14.1.2 Number of target compounds in each analysis: 33

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%

Note:

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

Reviewer: RA
Date: 9/20/02
Lab: STL

Project Name: Sunset
Project Number:
SDG No.: SA1122

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:

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:

collect-	extract-	analyzed
7/16/02	7/23/02	8/7/02 8/8/02
7/17/02	"	8/8/02
7/17/02	8/9/02	8/10/02

→ SOIL - Q-5-6 RE extract- 9 days outside HT - J(+)/h

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: IC 8110.02
2,6-dinitrotoluene 0.987
3-nitroaniline 0.988
4-nitroaniline 0.986
all results prev. flagged due to HT in ass. sample
no more action

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 8/8/02 4-nitrophenol 24.7% no pos.
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:

SOIL-P-3-0.5 DF=5 J, UJ, S
SOIL-Q-3-0.5 DF=5 "
SOIL-Q-3-6 " "

SOIL-Q-5-6' 2-fluorophenol 8%, 2,4,6-tribromophenol 0% J, R, S in acid. compds.
Sur. also diluted out in several samples DF>10. no action

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:

MSD n-nitrosodiphenylamine 50 < 51-132

MS, 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: 2,4-dimethylphenol 91, 94 7 33-84

No pos. 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 > 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:

		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: 10			
14.1.2	Number of target compounds in each analysis: 67			
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 = 98%

Note:

33 x 2 + 1 = 67

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

Reviewer: RA
Date: 9/20/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA1122

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:

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:

	collect.	extract.	analyzed	
Soil	7/16/02	7/23/02	8/9/02,	8/21/02
	7/17/02	"	8/9/02,	8/10/02

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: 8/9/02 1749 alpha-BHC (20.1, 24.8), heptachlor (21.9, 18.2), delta-BHC (26.7, 28.2), DDT (17.1, 16.2)
Primary DDE 34.7, endosulfan II 15.8, conf. heptachlore epoxide 15.4
8/9/02 2359
See attached - J/UJ/C and samples

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.	OK	[ ]	✓

Note: Sur. diluted out all samples
~~J/UJ's in soil - Q - 5 - 0.5 unless prev~~ RA
all others DF 7/10 no action

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: Diluted out 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:

10.0 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, beta-BHC, alpha-chlordane-endosulfan I, endosulfan sulfate heptachlor epoxide, endrin aldehyde, endrin ketone, Lindane, gamma-chlordane methoxychlor, dieldrin, 4,4-DDT, 4,4-DDE, endrin, 4,4-DDD, heptachlor, DDT "E" in soil - P-4-6 use DF=40 endosulfan II 740%, J/g unless prev. → prev flagged for calib.

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 156% in soil - P-4-6 DL pos. prev flagged due to calib - 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: 9/20/02
Lab: STL

Project Name: Sauget
Project Number:
SDG No.: SA1122

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:

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:

	Collect.	extract.	analyzed
Soil	7/16/02	7/24/02	8/16/02, 8/12/02
	7/17/02	"	8/12/02, 8/16/02

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: Sur. diluted out for SOIL-P-1-6 (DF=50), SOIL-P-4-6 (D=50), SOIL-P-3-6 (D=50)

SOIL-Q-5-0.5, SOIL-P-4-0.5 also in some other samples DF>10 no action ✓

✓ DF=5, J/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: MS/MSD upper QC 140 for trichlorobiphenyl 160, pentachlorobiphenyl (260, 530) hexachlorobiphenyl 200, 270 (260)

MSD > QC tetrachlorobiphenyl 200 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 > 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:

Chrysene-d12 >50% for SOIL-P-1-6 186%, SOIL-P-4-6 153%, SOIL-P-3-6 145%, SOIL-Q-5-6 155%, SOIL-Q-3-0.5 134%. pos J,n

Phenanthrene-d10 >QC for several - not used - no action

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: SOIL-P-4-0.5 trichlorobiphenyl, tetrachlorobiphenyl, Pentachlorobiphenyl hexachlorobiphenyl exceeded "E" → J.q used 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:

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: 9/19/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SA1122

56

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:

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:

	collected	extracted	analyzed
Soil	7/16/02	7/25/02	8/3/02
	7/17/02	"	" , 8/23/02

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 8/3/02 0741, Primary MCPP 22.2, MCPA 16.1, 2,4-D 15.7
Conf. 2,4-DB 21.5
CC 8/3/02 1927 Prim MCPP 18.8, 2,4-D 18.8
Conf. 2,4-DB 16.3
pos. 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: Soil-Q-3-0.5 DCA A 325 > 189 → 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: non-client sample was used - high DF - MS/MSD not provided - comment - form

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: Pentachlorophenol "E" in SOIL-Q-3-0.5 prev. flagged due to sur-failure. use diluted 2,4-D, Pentachlorophenol, 2,4,5-T, MCPP, dichloroprop, dicamba 74%. In some samples were flagged P by lab → J.g. unless 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.: SA1122
Lab: STL

Project Name: Sauget Area II
Reviewer: RA
Date: 9/20/02

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
7/16,17,02 7/25,26,02 ICP
" 8/2,02 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(+/-) < 65%; J(+)/UJ(-) 65% - 79%; J(+) 121% - 135%; R(+) > 135%. Other Metals: R(+/-) < 75%; J(+)/UJ(-) 75% - 89%; J(+) 111% - 125%; R(+) > 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: arsenic initial CRDL 59%. Pos. JIW in all
lead " " 128, final 125) not serious no action ✓
sodium initial 75%.
Tl " 138%.

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 ba .182 mg/kg x5 = .91 MB → cd -.045 x5 = -.225
cr .0953 = .4765
potassium 3.4 x5 = 17
sodium 34.1 x5 = 170.5
pos. sodium U,P in soil — P-4-0.5 at RL

		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: al, ba, copper, Mg, Tl, Ca, Cr, Potassium at low levels no action- ICB, CCB

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: antimony MS/MSD <QC 39/40 J/UJ, m
potassium MSD 130% all pos. 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: cobalt 10.6 J, S
zinc 11.8

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

Reviewer: MSShadle
Date: October 1, 2002
Lab: STL- Savahanna

Project Name: Sauget Area II
Project Number: 21560888.06004
SDG No.: SAII23

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: 5.3°C, 5.0°C, 4.4°C, 4.2°C, 1.2°C, 2.0°C, 1.9°C, 3.4°C, 1.7°C, 2.3°C, 3.0°C, 1.8°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 Sampled: 7/17/02
Date Prepped:
Date Analyzed: 7/22/02 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:

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:

IM0722MB

2-butanone 1.8 ug/kg x5 = 9 "U,Z"

MIBK 0.62 ug/kg x5 = 3.1

2-hexanone 1.9 ug/kg x5 = 9.5

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: ICAL 7/11 INSTRUMENT MS05973
acetone 0.0487 J+/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: CCV 7/22 @ 0945 MS05973
1,1-dichloroethane 31.4% ND ✓
acetone 0.04156 J+/R- ✓
CCV 7/22 @ 1134 MSM5972
bromomethane 21.8% ND
$MeCl_2$ -43.0% ND
CCV 7/23 @ 1924 MS05973
acetone 0.04672 J+/R- ✓
1,1-dichloroethane 49.8% ND
1,2-dichloroethene (total) 32.4% ND
CCV 7/25/02 @ 1617
acetone 0.04167 ✓ J+/R-
2-hexanone -20.7% ND

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 Dup (Low) Med
Acetone (32%) J+ 1,1-dichloroethane 132% ↑ all ND
$MeCl_2$ (44%) ? all ND
2-Hexanone (47%) J

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: 1

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

% Completeness = 164/165 = 99.3%

Note:

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

Reviewer: MSWadle
Date: October 2, 2002
Lab: STL - Savannah

Project Name: Sauget Area 2
Project Number: 21560888.06003
SDG No.: SAT23

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 - 5.3°C, 5.0°C, 4.4°C, 4.2°C, 1.2°C, 2.0°C, 1.9°C, 3.4°C, 1.7°C, 2.3°C, 3.0°C, 1.8°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 Sampled - 7/17/02, 7/16/02
Date Prepped - 7/23/02 6 days, 7 days
Date Analyzed - 8/8/02 16 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:

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: All samples were analyzed @ dilutions.

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? (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: Mashadli
Date: October 2, 2002
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number: 21560888.06003
SDG No.: SAII23

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- 5.3°C, 5.0°C, 4.4°C, 4.2°C, 1.2°C, 2.0°C, 1.9°C, 3.4°C, 1.7°C, 2.3°C, 3.0°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 Sampled - 7/16/02, 7/17/02
Date Prepped - 7/23/02 6 days, 7 days
Date Analyzed - 8/9/02 17 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 8/9/02 @ 1152 (front) / (rear) 8/9 @ 1749

α-BHC	-18.5% / -24.2% ✓	α-BHC	-20.1% / -24.8% ✓
delta-BHC	-22.9% / -24.6% ✓	heptachlor	-21.9% / -18.2% ✓
4,4'-DDE	-25.3%	delta-BHC	-26.7% / -28.2% ✓
TMX	-18.2%	α-chlordane	-17.8%
		4,4'-DDE	-34.7%
		endosulfan II	-15.8%
		4,4'-DDT	-17.1% / -16.2% ✓
		TMX	-16.2%
		DCBP	-22.2% / -19.4%
		heptachlor epoxide	/ -15.4%

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: All samples are analyzed at dilutions.

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: Several samples have column imprecission >40%

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: 451356-1 185841/100618 = 185% (J+)
bromonitrobenzene

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: MSShadle
Date: October 2, 2002
Lab: STL - Savannah

Project Name: Sauget Area 2
Project Number: 21560888.06003
SDG No.: SAII23

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 Temps all 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 Sampled - 7/16/02, 7/17/02
Date Prepped - 7/24/02 7 days, 8 days
Date Analyzed - 8/13/02 25 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:

Several samples were analyzed at dilutions.

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:

3Cl BP - 160%/260%
5Cl BP - 260%/530%
6Cl BP - 200%/270%
4Cl BP - /200%

all parent samples results > 4x spiking amt. No data qualifying action taken

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: Mildhadle
Date: October 2, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888.06003
SDG No.: SAII03

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 Temps: All 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 Sampled - 7/17/02, 7/16/02
Date Prepped - 7/25/02 8 days, 9 days
Date Analyzed - 8/3/02 9 days
8/15/02 21 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 8/3/02 @ 0741 — mCPP 22.2% / mCPA 16.1% / 2,4-D 15.7% / 2,4-DB /-21.5%

8/3 @ 1927 — mCPP 18.8% / 2,4-D 18.8% / 2,4-DB /-16.3%

8/15 @ 1206 — mCPP 18.0% / 16.6% / 2,4-DB 16.7% / 16.2% / dinoseb 21.3% / 21.5%

8/15 @ 2200 — mCPP 16.8% / mCPA /23% / 2,4-D /16.1% / 2,4-DB /17.0%

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: Sample 45080C-1 DCAA (1005) 0%

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: Several samples had %RPDs between columns >40%

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

Project Name: Sauget Area II
Reviewer: Musshadle
Date: October 2, 2002

SDG No.: SAII23
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 - 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: Date Sampled - 7/16/02, 7/17/02
Date Prepped -
Date Analyzed - 7/25/02, 7/26/02, 7/29, 7/30 8day, 9 day, 10 day, 13 day, 12 day, 14 day

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 59% J/UJ Al /124%
Pb 128% /124%
Pb 66%/
Na 75%/
Tl 138%/

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 0.02874 mg/L (SOIL) 0.1437 (WATER)
ICB: Al 0.03956 -- 0.1978
0.91 0.475 170.43
Prep Blank - Ba 0.182 mg/kg, Cr 0.095 mg/kg, Na 34.086
Cd -0.045 " , K 3.403 "
0.225 , 17.015

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.	✓						✓	✓ (1)				
8.4	Were any transcription/calculation errors noted in the laboratory duplicate data? Level IV only.		✓						✓				

Note: ~~Hg~~ - 102.3% (1) Inconsistent usage of duplicate other lab dup met criteria

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: Al 851% / 1000% (70%) > 4x ✓ Mg ✓ 153% / 513% (84%) > 4x / dg - ✓ -192% / 49% (96%) > 4x
Sb 39% / 140% (95%) J+/UJ Mn / 19% (92%) > 4x ✓
Ca 164% / 514% (-93%) > 4x ✓ K / 130% (100%) ✓ -- MS ok no active ratio
Fe 411% / 574% (-195%) > 4x ✓

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

Reviewer: A.J. RA
Date: 10/01/02
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SA II 25

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[X]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[X]		
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?		[X]	
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".	[X]		

Note: Cooler temps: 5.6°C, 2.0°C, 1.9°C, 2.2°C, 3.4°C, 2.4°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(-).		[X]	

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: Sampled 7/18 rec'd 7/19 analysis 7/24
7/19 7/20 7/25

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)?	[X]		
3.2	Have all samples been analyzed within twelve hours of the BFB tune?	[X]		
	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?	[X]		
	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: BFB checks - 05/21, 07/24 (07:55), 07/25 (08:39)

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)?	[X]		
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?	[X]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	X	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	X	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[X]		
	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.		[X]	✓

Note: LP0724MB- chloromethane [0.39] > associated samples flagged U,z at RL
LP0725MB- chlorobenzene [0.78] > if positive hits in these T.C's.

TB-071802-KH - [0.25] - chloromethane, [0.67] - trichloroethene, [0.71] - CB.
TP-226B-KH - [0.62] - chloromethane
all associated positive hits were flagged U,y. - if not already flagged U,z from M.B. contamination

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[X]		
5.2	Are calibrations linear for over the concentration range of the calibration applying either %RSD <15% or r >0.995?	[X]		
	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.		[X]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[X]	✓

Note:

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[X]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[X]		
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.		[X]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[X]	✓

Note: CC 7/25/02

bromomethane 21.5%. all ND, no flags

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[X]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[X]		
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.		[X]	✓

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?	[X]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[X]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[X]		

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?	[X]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[X]		
9.3	Are all LCS %Rs within acceptance criteria?	[X]		

	> 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's on 07/24 + 07/25

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?	[X]		

	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?	[X]		

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: RT summaries for 07/24 + 07/25 batches

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?	[X]		
	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%?	[X]		

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?	[X]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[X]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		X
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[X]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[X]	

Note: GW-AA-Q-3-50- [chlorobenzene] exceeded linear range - flagged J, q.
GW-AA-R-1-48 acetone J, q low. Result from DF=400

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]	X	✓
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		X
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		X
	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: ~~No field duplicates submitted for this batch. will be noted in DV report.~~ RA

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)	[X]		

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: A.J. RA
Date: 10/02/02
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 25

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	[X]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[X]		
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?		[X]	
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".	[X]		

Note: Cooler temps: 5.6°C, 2.0°C, 1.9°C, 2.2°C, 3.4°C, 2.4°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(-).		[X]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[X]	

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

Note:

sampled	extracted	analyzed
07/19	07/23	08/02
07/20	07/25	08/12
07/20	07/25	08/13
07/20	07/25	08/14
07/20	07/25	08/09

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[X]		
3.2	Have all samples been analyzed within twelve hours of the tune?	[X]		
	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?	[X]		
	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: Tunes done on 08/01 (22:05)
08/09 (12:05)
08/12 (08:29)
08/13 (10:00)
08/14 (08:44)

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)?	[X]		
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?	[X]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	X	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive SVOA results (TCL, and/or TIC)?		[ ]	X
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		X
	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.		[X]	✓

Note: MB summaries 08/01, 08/09
MB 0723H-GMB results: [1.4]-phenol, [1.1]-dichlorobenzene, [1.4]-2-methylphenol, [1.8]-bis(2-chloroisopropyl)ether, [1.4]-N-Nitroso-di-n-propylamine, [1.3]-3,4-methylphenol, [1.7]-Nitrobenzene, [1.7]-Isophorone, [1.2]-2,4-dimethylphenol, [1.3]-bis(2-chloroethoxy)methane, [1.1]-2,4-dichlorophenol, [1.3]-Hexachlorobutadiene, [1.2]-4-chloro-3-methylphenol, [1.3]-2-methylnapthalene, [1.3]-2,4,6-trichlorophenol, [1.0]-2-nitroaniline, [1.1]2,6-DNT, [1.5]-Acenaphthene, [1.4]-Dibenzofuran, [1.1]-2,4-DNT, [1.4]-Dimethylphthalate, [1.4]-Diethylphthalate, [1.4]-4-chlorophenyl-phenylether, [1.2]-N-nitrosodiphenylamine, [1.2]-4-bromophenyl-phenyl ether, [1.6]-Hexachlorobenzene, [1.5]Phenanthrene, [1.4]-Anthracene [1.3]-Di-n-butyl phthalate, [1.5]-Pyrene, [1.1]-Butylbenzylphthalate, [1.4]-Benzo-a-Anthracene, [1.8]-Chrysene,

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[X]		
5.2	Are calibrations linear over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[ ]	X	
	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.		[X]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[X]	✓

def ND → W, V

Note: MSG5973 ICAL 07/31 - 2,4-Dinitrophenol R^2=0.9875, ~~4-nitroaniline R^2=0.9911~~
~~4,6-Dinitro-2-methylphenol R^2 = 0.9948~~
~~MSE5973 ICAL 08/02 - 2,4-Dinitrophenol R^2 = 0.9922~~
No associated positive results, so ~~no action was taken~~ ✓ RCA

6.0 Continuing Calibration

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

Note: C CCALs - 08/01, 08/09, 08/12, 08/13, 08/14,
C CCAL 08/01 - 2,4-Dinitrophenol - %D 23.2%, Indeno(1,2,3-cd)pyrene %D 25.9%
4-chloroaniline %D 34.8%, Benzo(b)fluoranthene %D 20.2%
08/09 - Hexachlorocyclopentadiene %D 27.8%, 2,4-Dinitrophenol %D 23.2%,
4-nitrophenol %D 21.2%, 4,6-Dinitro-2-methylphenol %D - 26.6%
dinoseb %D 39.3%
08/12 - Hexachlorocyclopentadiene %D 27.1%,
08/13 - 2-Nitrophenol - %D 20.2%, Hexachlorocyclopentadiene %D 39.1%

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? 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: Surr. diluted out in GW-AA-R-1-28 DF=50
" " DL DF=100
GW-AA-R-1-48 DF=50
" " DL DF=500

DF 710 no action ✓

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: Extraction log from lab indicates that "insufficient sample volume was available to perform a batch matrix spike analysis."

LCS/LCSD were provided see below

9.0 Laboratory Control Sample (LCS)

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

	> 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.		[X]	✓

Note: RPD 7 QC 33-132% for benzo(b) fluoranthene 38%
no pos, no flags

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?	[X]		

	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?	[X]		

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.		[X]	✓

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?	[X]		
	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%?	[X]		

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?	[X]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[X]		
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".	[X]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[X]	✓

Note: positive results that exceeded the linear range of the instrument were flagged J, q use to diluted results.

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	[ ]	X	
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		X
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		X
	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: NO field duplicates in this batch.

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)	[X]		

14.1.1 Number of samples: 10

14.1.2 Number of target compounds in each analysis: 67

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: RA
Date: 10/11/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 25

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: 3.6, 2, 1.9, 2.2, 3.4, 2.4,

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
7/18/02	7/23/02	5	7/24/02	3
7/19/02	"	4	"	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
all ND, 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 < 30-50 in
GW-AA-G-2-80FT 20, 15
GW-AA-C-3-128 16, 11 } all ND, no flags
GW-AA-R-1-28 22% one fell more
no action

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 see below

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: alpha-chlordane (LCS) 52% <65% - 125%.
Pos, J, ✓
ND 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 >40% in GW-AA-R-1-2Cn → Tag

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: RA
Date: 10/11/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 25

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
7/18/02	7/24/02	6	7/26/02	2
7/19/02	"	5	"	2

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: 10/14/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 25

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: 5.6, 2, 1.9, 2.2, 3.4, 2.4

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

		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
	7/18/02	7/23/02	5	8/1/02	8
	"	"	"	8/20/02	28
GW ~~AA-G-2 80FT~~ RE → ~~9/6/02 15 days~~	"	8/9/02	22	8/19/02	10
	7/19/02	7/23/02	4	8/1/02	8

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 8/1/02 2,4-D 3.7 ug/L, pentachlorophenol 0.2 ug/L
extracted 7/23/02 Pos<5X, U, or UJ at 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 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-
No pos for CC 7/3/02, 8/1/02 failures - no action
CC 8/20/02 prev. flagged

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-

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-D (2%) < 11-154%. Pos. were prev. flagged-
NDs → R,J

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: several compds >40%, J/g unless prev. flagged -
2,4-D "E" in GW-AA-Q-2-80FT prev. due to MB
use result DF=2

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: 5

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 2

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

% Completeness = 96%.

Note:

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

SDG No.: 25
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 10/14/02

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
7/18,19,02 7/30,31, 8/2, 8/6, 8/9, 8/20, 02 ICP
" 7/31, 02, 8/1, 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.			✓						✓			

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

Note: CRDL initial and final thallium 69, 67%, 67% iron 69, 127%
initial al (135), as (125)
final ~~[illegible]~~, se 72, sodium 69 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, copper, pos. cu < 5x 0, P at RL
MB → neg. as, potassium, thallium NDs → UJ, P in ano. samples
ICB, CCB, low levels of al, ba, ca, cu, mn, Fe, and neg. for as.
as prev. flagged - no action for others 7 5x ✓

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 15%
zinc 15.1% } 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: 10/11/02
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.: 25
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:

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
7/18/02	7/19/02	1
"	7/23/25/02	5, 7
7/19/02	7/21/02	2
"	7/24/31/03	10/11

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: 10/1/02
DV Level: II (III) IV
Review Document:
✓ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sawsgt
Project Number:
Laboratory: STL
SDG No.: 25
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:

collect	analyzed
7/18/02	7/3/02
7/19/02	7/25/02

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 FID → JIR
CC 7/3/102 4 %D 22.6% FID Prev. flagged-

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: methane "E" in GW-AA-R-1-28

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: Middlebrooks
Date: October 3, 2002
Lab: SR - Savannah

Project Name: Sauget Area II
Project Number: 21560888.0600
SDG No.: SATT216

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 - 4.9°C, 5.1°C, 5.0°C, 4.6°C, 4.8°C, 2.0°C, 1.9°C, 2.2°C, 3.4°C, 2.4°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

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

Note:

Date Sampled - 7/19/02, 7/18/02, 7/16/02
Date Prepped -
Date Analyzed - 7/29/02, 7/30/02, 7/31/02

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 ~~S~~VOAs?		[✓]	
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:

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 7/29 @ 1106
2-butanone 33.1%

CCV 7/31 @ 1314
2-butanone 52.8%

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 -
2-butanone 168%/ (40%)

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: 7/29/02
2-butanone 176% ↑

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: 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
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: [illegible]
Date: October 3, 2002
Lab: STL - Savannah

Project Name: Sanger Area 2
Project Number: 2156088.06004
SDG No.: SAII26

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 Sampled - 7/16/02, 7/17/02, 7/18/02
Date Prepped - 7/24/02, 7/23/02 8 days, 7 days, 6 days, 5 days
Date Analyzed - 7/28/02, 7/29/02, 7/30 4 days, 5 days, 7 days, 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: _____

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 8/6 @ 1032
total cresols
missing ICAL value
- fixed problem. No anomaly.

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 (45160A-7)
- hexachlorobenzene 48%

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? (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: 13

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 %

SA

Note:

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

Reviewer: Mcshandle
Date: October 3, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888.06004
SDG No.: SATI26

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 temps 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 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 Sampled - 7/16/02, 7/17/02, 7/18/02
Date Prepped - 7/24/02, 7/23/02 5 days, 6 days, 7 days, 8 days
Date Analyzed - 8/4/02 11 days, 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 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 8/3 @ 2052 CCV 8/4/02 @ 0722

α-BHC	-19.7%	heptachlor	19.9%
gamma-BHC	-16.8%	4,4'-DDT	29% / 16.1%
delta-BHC	-17.0% / -16.6%	TMX	-22.3%
heptachlor epoxide	-18.2%	~~endosu~~ endosulfan sulfate	/ 15.5%
4,4'-DDT	28.4%	2,4-DCAA	/ -16.0%
TMX	-36.6% / -24.5%		
2,4-DCAA	/ -17.2%		

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:

0723P-MFB	TXM	25%/29%		
45160A-5	TXM	24%/27%		
45160A-8	TMX	26%/28%		
45160A-MSD	DCAA	5%/4%	TMX	0%/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: 45160A-7
gamma-BHC (41%) endrin /32% (88%)
heptachlor /0% (200%)
heptachlor epoxide /0% (200%)

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: Waste-P-2-COMP-T
heptachlor 102.2%

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: 0724N-MFB 24833/16517 = 150.3% > 150% okay
bromobrobenzene

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: Nashville
Date: October 3, 2002
Lab: STL- Savannah

Project Name: Sauget Area 2
Project Number: 21560888.06004
SDG No.: SA II 26

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 are 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 Sampled - 7/16/02, 7/17/02, 7/18/02
Date Prepped - 7/24/02
Date Analyzed - 7/29/02, 7/30/02, 7/26/02

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: Mitchell
Date: October 3, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888.06004
SDG No.: SAII26

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 Temps - 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 ~~Ana~~ Sampled - 7/16, 7/17, 7/18
Date Prepped - 7/24
Date Analyzed - 7/27

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: 07240-SFB1 - field blank 2,4-D 0.018 mg/L 4,2

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 7/27/02 @ 1411

2,4-DB 1-16.9%

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.: SAT1Z6
Lab: STL - Savannah

Project Name: Sauget Area II
Reviewer: Mudthadle
Date: Oct 3 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: Date Sampled - 7/16, 7/17, 7/18
Date Prepped -
Date Analyzed - 7/29,

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
Pb - 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: CCB3 CCB5
Pb -0.00152 mg/L Pb -0.00226

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:

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: MAdhadle
Date: October 3, 2002
Lab: STL-

Project Name: Sauget Area II
Project Number: 21560888.06004
SDG No.: SAII27

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 - 4.9°C, 5.1°C, 5.0°C, 4.6°C, 4.8°C, 2.0°C, 5.6°C, 1.9°C, 2.2°C, 3.4°C, 2.4°C, 5.8°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 Sampled - 7/19/02, 7/18/02, 7/16/02
Date Prepped - 7/19/02
Date Analyzed - 7/23/02, 7/29/02, 7/24/02, 7/25/02, 7/30/02, 8/5/02-X

Sample SOIL-Q-8-6 DCRE 7/25

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:

7/8- okay 7/25 - okay
7/11 - okay 7/29- okay
7/23- okay 7/30- okay
7/24- okay 8/5- okay

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 ~~8~~VOAs?	✓	[ ]	
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:

7/24/02 1M0724MB
4-methyl-2-pentanone 0.65 ug/kg
2-hexanone 2.0 ug/kg
all ND's

7/25/02 1M0725MB
4-methyl-2-pentanone 0.58 ug/kg
2-hexanone 2.0 ug/kg
29 11,2

1M0730MB
benzene 250 ug/kg x5 = 1000
TCE 220 ug/kg
toluene 240 ug/kg x5 = 1200
chlorobenzene 260 ug/kg x5 = 1300
1,1-dichloroethane 160 ug/kg

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: ICAL - 7/11
acetone 0.0487 J+/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: CCV 7/23/02 @ 0948 (MSM5972)
$MeCl_2$ - -42.5% all ND
7/23/02 @ 1924 (MS05973)
acetone 0.04672
1,1-dichloroethane 49.8% J ND
1,2-dichloroethane (bkd) 32.4% J

CCV 7/24 @ 1015 (MSM5972)
chloromethane -21.9% J ND
$MeCl_2$ -44.6% J
7/25 @ 1306 (MSM5972)
bromomethane 39.3% J ND
$MeCl_2$ -40.1% J

CCV 7/29/02 @ 1813 (MS05973)
chloromethane -26.9%
acetone 0.04034 (ND)
1,1-dichloroethane 30.5%
7/30/02 @ 1000 (MS05973)
acetone 0.04486
1,1-dichloroethane 32% ND

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:

45160B-3 4-bromofluorobenzene 58%
-1 RE " " 62%
-3 RE " " 50%
} 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: 45203B-4 - okay

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:

1M0723 LCS - okay
20Ø723 LCS - okay
1M0724 LCS - okay
1M0725 LCS - okay
20Ø729 LCS
- acetone 170% - previously flagged
1,1-dichloroethane 136% NO
10Ø730 LCS
- 1,1-dichloroethane 136%
2-hexanone 130%
both NO
10Ø805 LCS
-1,1-dichloroethane 136
(previously flagged not to be considered)

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:

✓ 45160B-3 1,2-dichloroethane-d4 84591/234870 (36%), 1,4-difluorobenzene 320022/838256 (38), chlorobenzene-d5 - (17) previously flagged 60005/347748
45160B-1 chlorobenzene-d5 141065/347748 (41)
✓ -1RE 1,2-dichlorobenzene-d4 186545/234870 (79), chlorobenzene-d5 100029/347748 (29) - previously flagged
-3RE 1,2-dichlorobenzene-d4 74222/234870 (32), 1,4-difluorobenzene 268646/838256 (32), chlorobenzene-d5 (10) 35154/347748 - previously flagged
45219A-2 chlorobenzene-d5 123771/349332 (36)

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-Q-7-0.5			benzene	3.7 / 12 ok		chlorobenzene	42 / 220	136% J/UJ	SOIL-Q-8-6	acetone	170 / 100 ok	xylene	2200 / 400
												toluene	70 / 97 ok
acetone	61 / 910	J/UJ	TCE	1.0 / 1.0 ok		ethylbenzene	25 / 45	ok	carbon disulfide	11 / 6.8 ok		TCE	2.3 / 0.6 ok
carbon disulfide	5.6 / 5.2		MIBK	8.4 / 12 ok		xylene (total)	180 / 170	ok	2-butanone	50 / 27 ok		PCE	1.4 / 0.61 ok
												chlorobenzene	670 / 95

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 = 100%

Note: _____

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

Reviewer: Middlebrooks
Date: October 4, 2002
Lab: STL - Savannah

Project Name: Sangat Area 2
Project Number: 21560888.06004
SDG No.: SA II 27

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 are 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 grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Sampled - 7/16/02, 7/17/02, 7/18/02
Date Prepped - 7/26/02
Date Analyzed - 8/7/02, 8/8/02, 8/13/02, 8/15/02, 8/14/02, 8/9/02

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: 0726D-EMB- okay

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:

8/7 @ 746 okay

8/8 @ 1034

4-nitrophenol -24.7% all ND

8/9 @ 1221

hexachlorocyclopentadiene -27.8%

2,4-dinitrophenol 23.2%

4-nitrophenol -21.2%

4,6-dinitro-2-methylphenol 26.6%

all ND

CCV 8/13 @ 1016

hexachlorocyclopentadiene -39.1%

2,4-dinitrophenol 32%

4,6-dinitro-2-methylphenol 25%

indeno(1,2,3-cd)pyrene -21.3% (J+)

dinoseb 35.8%

CCV 8/14 @ 0900

bis(2-chloroethyl)ether 22.9% all N

hexachlorocyclopentadiene -41.8%

dinoseb 35.7%

CCV 8/17 @ 2224

bis(2-chloroethyl)ether 24.6%

hexachlorocyclopentadiene -41.2%

dinoseb 24.9%

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.	[✓]		

	> 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:

45160B-4DL	(5x) ok	45203B-1	2x all surrogates within range
45160B-6	5x ok		
45219A-2	10x ok		
-3	10x ok		
45160B-6DL	25x ok		
45203B-3	5x 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:

45203B-4		1,2-dichlorobenzene (25%)	
2,4,6-trichlorophenol	40%	1,2,4-trichlorobenzene (24%)	attach
dimethylphthalate	40%	2,4-dimethylphenol 17%	
n-nitrosodiphenylamine	40%	bis(2-ethylhexyl) phthalate (24%)	
butyl benzyl phthalate	46%		
benzo(a) anthracene	39% / 53%		
chrysene	44%		
[illegible]	30%		

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: SOIL-Q-7-0.5

1,4-DCB	320/280	Butylbenzylphthalate	320/120	benzo(k)fluoranthene	360/380
Phenanthrene	590/690	benzo(a)anthracene	450/400	benzo(a)pyrene	430/380
Anthracene	130/130	chrysene	680/490	indeno(1,2,3-cd)pyrene	150/140
Fluoranthene	1300/850	bis(2-ethyl hexyl)phthalate	240/2200	benzo(g,h,i)perylene	240/220

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: Mitchell
Date: October 6, 2002
Lab: SR - Savannah

Project Name: Sauget Area II
Project Number: 21560888.06004
SDG No.: SA427

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 Temps - All temps are 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 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 Sampled - 7/16/02, 7/17/02, 7/18/02
Date Prepped - 7/29/02, 7/26/02
Date Analyzed - 8/3/02, 8/8/02

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:

8/3 @ 1023			8/3 @ 1933		8/8 @ 2119	
methoxy chlor	18.7% / 26.5%	J/UJ	heptachlor	-17.6%	delta-BHC	-16.1%
endrin Ketone	18.4% / 19.6%	J/UJ	endosulfan I	-18.9%	4,4'-DDE	-16.3%
2,4-DCAA	16.2%		4,4'-DDT	-16.7%	methoxy chlor	22.5%
4,4'-DDT	/ 16.5%		methoxy chlor	17.9%	2,4-DCAA	-17.3%
endosulfan sulfate	/ 17.9%		DCBP	-22.0% / -19.9% (surrogate)	α-BHC	/ -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:

✓ 0729P-RMBLCS	DCAA	26%/24%	TCX	26%/26%	DCB	/29%	~~surrogate~~	QC sample	
✓ 45203B-5	DCAA	26%/28%	TCX	22%/28%	~~1x~~			J/UJ	
✓ 45219A-1	DCAA	24%/	TCX	27%/	1x				
45160B-1	2x all others	45160B-6	5x	45219A-3	5x	45203-B-1	6x		
-3	2x DCB2(16%)	45203B-2	5x	-2	5x				
-4	20x all	-3	10x other						

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: β-BHC 0%/0% & 74x endosulfan II 6%/(70%) ok methoxychlor 164%/260% (45%) J+
gamma-Chlordane 0%/0% 74x 4,4'-DDD 192%/(67%) ok endrin (122%) J,d
4,4'-DDE 0%/0% 74x 4,4'-DDT 0%/0% 74x endrin ketone 120% (83%) okay
dieldrin 0%/0% 74x endrin aldehyde 133% okay

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: 0729P-RMBLCS
α-chlordane 30% ↓ J/R
4,4'-DDE 28% ↓

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 samples contain % RPDs > 40%.

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: 4,4'-DDT SDIC-Q-7-0.5 145%

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: 45160B-6 308132/59285 520%
45219A-1 95463/59285 161%

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: 21

14.1.3 Number of results rejected and/or not reported: ~~IIII~~ IIII 9

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

% Completeness = 280/294 95.2%

Note:

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

Reviewer: [illegible]
Date: October 6, 2002
Lab: STL - Savannah

Project Name: Sanger Area 2
Project Number: 21560888.06004
SDG No.: SA II 27

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 Temps - All cooler 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 Sampled - 7/16/02, 7/17/02, 7/18/02
Date Prepped - 7/29/02
Date Analyzed - 8/19/02, 8/20/02

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: CCV 8/18 @ 1926
Cl_2 biphenyl -okay <30%

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:

45160B-6	50x	45219A-1	5X
-3	20x	-2	20x
-4	10x	-3	20x
45203B-1	10x		
-2	10x		
-3	10x		

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: All compounds low except Cl_2 biphenyl in MSD.

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:

45219A-2 chrysene-d12 95043/60971 = 156%

-3 phenanthrene-d10 131286/92486 142% chrysene-d12 95505/60971 156%

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-Q-7.0.5

Cl_3 BP 170/530 103% Cl_8 BP 33/130 ok

Cl_4 BP 530/1700 105% Cl_9 BP 36/230 ok

Cl_5 BP 470/940 67% 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
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: MAWhadle
Date: October 6, 2002
Lab: STL- Savannah

Project Name: Sauget Area II
Project Number: 21560888.06005
SDG No.: SAII 27

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 Temps - 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 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 Sampled - 7/16/02, 7/17/02, 7/18/02
Date Prepped - 7/28/02, 8/19/02*
Date Analyzed - 8/5/02, 8/16/02, 8/23/02, 8/13/02, 8/15/02, 8/6/02, 8/21/02

* SOIL-Q-8-6 - reextracted outside hold time. J/UJ
SOIL-Q-8-6 DUP " " " J/UJ

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: 0819Q-SMB
PCP 1.6 ug/kg - ~~[illegible]~~ Previously flagged for holding time

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:

8/5 @ 2219		8/6 @ 0931		8/6 @ 2025		8/12 @ 1518			
PCP	-21.3% / -19.7%		-18.5% / -20.2%	MCPA	/ 15.5%	MCPP	18.4%	2,4-D	/ 19.1%
2,4,5-TP	-23.8% / -21.9%		-22.1% / -23.3%			dichloroprop	18.5%	2,4-DB	/ 23.4%
2,4,5-T	-25.4% / -23.4%		-22.2% / -24.2%			PCP	15.9%		
2,4-DB	-27.0% / -18.0%		-20.1% / -16.2%			dinoseb	19.9% / 22.1%		

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(-)

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

Note: 45219A-2 DCAA 11%/8% 1x J/UJ 45203B-4 25x
-3 " 11%/2% 1x J/UJ 45160B-6 10x
45203B-3, 2x J+ 45160B-BDL 100x

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.

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

Note: MS/MSD analyzed @ 25x dilution. No analytes recovered due to high dilution.

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: 0728N-SMB
MCPP 133% ↑ J+

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: Several samples had %RPD's >40%.

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-Q-7-0.5				SOIL-Q-8-6		
2,4-D	4.7 / 11	80.2%	7.85	MCPA	4300 / 2500 u	✓
PCP	45 / 120	90.9%	82.5	PCP	3.6 / 5.4	✓
2,4,5-T	3.0 / 4.1	✓				
2,4-DB	9.9 / 35	J/UJ				

19.8

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.: SAII27
Lab: STL- Savannah

Project Name: Sauget Area II
Reviewer: Muldhadle
Date: October 6, 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: Cooler Temp - All 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: Date Sampled - 7/16, 7/17, 7/18 Hg - 7/16, 7/17, 7/18
Date Prepped -
Date Analyzed - 7/31/02

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
Tl 127%, 121%, 124%, 76%
Al 134%
Se 65%
} all marginally outside limits

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: Al 1.1527 mg/kg 5.76 Se -0.83426 -4.1713
Cr 0.14681 0.734 Na 27.03194 135.16
Fe 10.606 53.03
Mg 0.89039 4.45

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: Al - 20.98% 3 ok 235
Ca 22.1% 3
Zn 50.67% - J+

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: Al 427% / -145% (46%) Fe 74x - 2770% / -4212% (-243) K 178% / 142% J+
Sb 65% / 165% J/UJ Pb J/UJ 60% / 38% Zn 221% / -147% 74x
74x Ca 13379% / 206036% (-213) Mg 74x 831% / 1206% (74%)
Cu 60% / 50% J/UJ Mn J/UJ 58% / 128% Hg -192% / 49% 74x (102%)

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: Co 11.1% 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-Q-7-0.5
Ba 110.5% J,f
Zn 139.6% J,f - previously flagged.
Hg 183.8% J,f/UJ,f

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.: SAII 28

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?	[~~✓~~] JA	[✓]	
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: 1.9°C - 5.8°C, only waste samples' data provided in this SDG.

~~(*) Waste Q-6-15-Dup was not listed on the COC.~~ (JA) OK found COC in SVOC section

(*) Sample Waste-Q-8-7 was received by the lab 3 days after sample collection. Encore sample prep. hold. time was exceeded. — use bulk container sample, OK.

(*) Sample Waste-P-2-6' was received by the lab 3 days after sample collection.

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(-). check with lab		[ ]	

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
(*)	7/16/02	7/29/02	13 days
	7/18/02	7/23, 29/02	5-11 days
	7/19/02	7/23-30/02	4-11 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: 7/8/02 (MSM5972) 7/8/02 1445 I. Cal
7/11/02 0857 (MS05973) I. Cal.
7/23/02 0923 (MSM5972).
7/25/02 1305 (MSM5972)) field samples + QC
7/29/02 1731 (MS05973)

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-1M0723MB All NDs (Low level).
MB-1M0725MB 4-methyl-2-pentanone (MIBK) 0.58 ug/kg
2-Hexanone 2.0 ug/kg
⊛ All NDs in sample Waste-Q-8-7. VL
MB-20 0729MB All NDs (Med-level).

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. 7/8/02 (MSMS972). All %RSDs or r^2 were in control.

I. Cal 7/11/02 (MSOS973) All %RSDs or r^2 were in control
RRF for acetone = 0.0487 → J, 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 7/23/02 0948 Methylene chloride −42.5%.

7/25/02 1326 Bromomethane 39.3%, Methylene chloride −40.1%.

7/29/02 1813 Chloromethane −26.9% → J.C, 1,1-dichloroethane 30.8% → J,R
RRF for acetone 0.04034.

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 - 45203B-4 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 - 1110723MB
LCS - 1M0725MB
LCS - 200729MB - Acetone 170%↑ (43-154%), 1,1-dichloroethane 136%↑ (51-129%)
J(+).

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:
Waste-Q-8-7 1,4-difluorobenzene 320936 ↓ (37.5%) (427979-1711916) J/UJ
Chlorobenzene-d5 102601 ↓ (29.4%) (174666-698664)
Sample was diluted (DF=40, Med-level) and displayed acceptable IS peak area.

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: Waste-Q-7-9 chlorbenzene J, q.

Waste-Q-8-7 Toluene, Ethylbenzene, Xylene → ~~J, q~~ Jv due to IS peak area failure.

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: 7

14.1.2 Number of target compounds in each analysis: 33

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 = 99.1%

Note:

	Waste-Q-6-15	Waste-Q-6-15-Dup.	RPD/Difference	RL
Acetone	1400	1700.	300 ug/kg / N	2400
CS_2	240 U	270	270 ug/kg / N	240.
Benzene	250	420	170 ug/kg / N	240
Toluene	3100	8800	96%	
Chlorobenzene	2100	4400.	71%	
Ethyl benzene	630	900.	270 ug/kg / N	240
Xylene	6900	8200.	17%	

/ N

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.: SAII28

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: 1.9°C - 5.8°C, only waste samples were reported in this SDG.

~~Waste sample waste-Q-6-comp Dup was not listed on the COC.~~ JA ok found the coc.

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
7/16/02	7/26/02	10 days	8/12,13/02	17,18 days
7/18/02	7/26/02	8 days	JA ~~8/8/02~~ 8/13/02	~~13 days~~ 18 days.
7/19/02	7/26/02	7 days	8/8, 14/02	13, 19 days
	7/30/02	11 days	8/10/02	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 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: 8/2/02 1645 (MS85973). I Cal.
8/7/02 0729. 8/8/02 0931, 8/9/02 1205) field samples, QC
8/10/02 1330, 8/12/02 0829, 8/13/02 1000)
8/14/02 0844

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-0726D-BMB All ND's

MB-0730A-BMB 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) 8/2/02. 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. 8/7/02 0746/0816 All %Ds < 20%

452036-2 ~~452036-1~~ — 8/8/02 1034/1110 4-nitrophenol -24.7%.

~~LCS~~ → 8/9/02 1221/1256 Hexachlorocyclopentadiene -27.8%, 2,4-dinitrophenol 23.2%
4-nitrophenol -21.2%, 4,6-dinitro-2-methylphenol 26.6%
Dinoseb 39.3%.

452911 → 8/10/02 1419/1448 Hexachlorocyclopentadiene 48.9%, 2,4-dinitrophenol 54.1% UJ,c
2,4-dinitrotoluene 28.0%, 4-nitroaniline 21.1%,
4,6-dinitro-2-methylphenol 21.3%. Dinoseb [illegible]

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: Waste-Q-4-COMP DF=4 Nitrobenzene-d5/2-Fluorobiphenyl 0% → J/UJ all base/neutrals
Waste-P-2-COMP DF=5 All surrogates were not recovered, J/UJ
Waste-Q-6-COMPDL DF=4 All base/neutral surrogates were not recovered. J/UJ
Waste-Q-6-COMP-DupDL DF=2 2 base/neutral surrogate were not recovered. J/UJ.
Waste-Q-4-COMPDL (DF=10) and Waste-P-2-COMPDL (DF=20) → All surrogates were diluted out JK.

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

MS/MSD - 45229B-5 see attached summary form

		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 - 45203B-4. 2,4,6-Trichlorophenol MS=40% ↓(41-130%)
Dimethylphthalate 40% ↓ (49-130%), N-nitrosodiphenylamine 40% (51-132%)
Butylbenzylphthalate 46% (58-122%), Benzo(a)anthracene 39% ↓ (54-137%) / 53%
Chrysene MS=44% (56-133%), Benzo(b)fluoranthene MS=38% ↓(43-134%)
2,4-dinitrophenol MSD=7% (10-125%)
1,2-dichlorobenzene RPD=25% (24%), 1,2,4-Trichlorobenzene RPD=24% (22%)
Bis(2-ethylhexyl)phthalate RPD=24% (22%).

This MS/MSD pair were re-analyzed and displayed similar results

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-0726D-BMB) All %Rs were in control.
LCS-0730A-BMB)

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/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: Waste-Q-6-comp / Waste-Q-6-comp-Dup.

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: 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: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 28

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: 1.9 - 5.8°C, only waste sample data were provided in this SDG.

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
7/16,18,19/02	7/26/02	7-10 days	8/5,15/02	13-20 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 - 0726Q-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. 8/7/12 All %RSDs or r^2 were in control. (SGRZCD)

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: 8/7/12 1925) All %Rs were in control
8/15/12 1324)

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: 8/8/02 2119 RTX-CLP delta-BHC -16.1%, 4,4'-DDE -16.3%, Methoxychlor 22.5%
2,4-DCAA -17.3%
RTX-CLP2 alpha-BHC -16.4%, ~~delta-BHC -15.1% ≈15%, ok~~, ~~Methoxychlor 15.3%~~ ≈15%
8/15/02 1356 RTX-CLP alpha-BHC -20.6%, ~~Heptachlor~~ delta-BHC -23.0%, 4,4'-DDE -33.0%
Endrin Ketone 20.4%, TCMX -25.6%, DCBP -25.0%
457600C-2 → RTX-CLP2 alpha-BHC -24.7%, delta-BHC -24.9%, Methoxychlor 37.9%, TCMX -21.6%.
457600C-1 8/15/02 1841 RTX-CLP alpha-BHC -16.6%, delta-BHC -23.3%, 4,4'-DDE -35.5%, 4,4'-DDD -16.6%
Endosulfan II -18.9%, 4,4'-DDT -19.8%, TCMX -19.7%, DCBP -27.7%.
RTX-CLP2 alpha-BHC -20.8%, delta-BHC -24.9%, DCBP -20.8%.

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: All surrogates were dilution in all samples except 45219B-1 (Waste-Q-8-COMP).
DF = 10 - 200, 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: MS/MSD - 45-203B-4.
beta-BHC 648%/595%, gamma-chlordane 648%/541%, alpha-chlordane RPD=53%
4,4'-DDE 438%/384%, Dieldrin 520%/438%, 4,4'-DDD MS=192%, RPD=67%
Endrin RPD=122%, Endosulfan II MS=6%, RPD=70%, 4,4'-DDT MS=1247%, MSD=972%,
Endrin aldehyde MS=133% Methoxychlor MS=164%, MSD=260%, RPD=45%
Endrin ketone MSD=123% 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-0726Q-RMB 4,4'-DDE 25% ↓ (34-21%)

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 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: Waste-Q-6-COMP/Waste-Q-6-COMP-Dup. — 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: 7

14.1.2 Number of target compounds in each analysis: 21

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 = 97.96%

Note:

	Waste-Q-6-COMP	WASTE-Q-6-COMP Dup.	Difference	RL
beta-BHC	16	51 U	16 ug/g	51
delta-BHC	23	51 U.	23	51
gamma-~~BHC~~ chlordane	43	38	15	51
alpha-chlordane	51 U	4.0.	4	51
44'-DDE	51	47	4	51
Dieldrin	41	52	11	51
44'-DDD	160	18	142 / N	99
Endrin aldehyde	48	99 U.	48	99
Endosulfan sulfate	28	48	20	99
Endrin ketone	99 U	91	91 / N	99

All Difference < 2XRL

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.: SAII28

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: 1.9 - 5.8°C, only waste samples provided in this SDG.

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
7/16, 18, 19/20	7/29/12	10-13 day	8/20, 21/12	22, 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: 8/18/02 0829 I. Cal.
8/18/02 1826
8/20/02 0516 } field samples, QC
8/20/02 1557
8/21/02 0657

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 - 0729B-KMB All NDs.
0729C-KMB 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.

I. Cal (MSK5972) 8/18/02 All %Ds <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 8/18/02 1926 All %Ds <30%.
8/19/02 0334 All %Ds <30%
8/20/02 0618 All %Ds <30%.
8/20/02 1445 All %Ds <30%
8/20/02 1738 All %Ds <30%
8/21/02 0037 All %Ds <30%
8/21/02 0800 All %Ds <30%
8/21/02 1655 All %Ds <30%

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: Most of surrogates were diluted out, see attached (DF=10-100) 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?	[✓]		
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 - 452038-4. 17 of 18 MS/MSD recoveries were low, see attached. due to matrix interference.

MS/MSD - 452293-5 ~~Tetra~~ Tri - 220%/250%, Tetra - 550%/660%
Penta - 890%/500%, Hexa - 290%/660% RPD=67%

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 - 0729B-KMB All %Rs were in control.

LCS - 0729C-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).

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:

Waste-Q-4-COMP Chrysene-d12 79529 ↑ 42680-79262
(130.4%) ≈ 130% OK

no data qualifier were applied.

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: Waste-Q-6-COMP / Waste-Q-6-COMP-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: 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:

		Q-6-COMP	Q-6-COMP-Dup		Difference/RPD	RL
	Di-	260	45		215 / NC	200
J.f	⊛ Tri-	1000	300	107.1%	700	200
	Tetra-	1700	3200	61.2%	~~1500~~ NC	410
J.f	⊛ Penta	1000	7200	157.2%	6200	410
J.f	⊛ Hexa	170	2200	171.3%	2030	410
	Hepta-	600 U.	100		100	600

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 28

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: 1.9 - 5.8°C, only waste samples provided in this SDG

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
7/16,18,19/02	7/29/02	10-13 days	8/6,16,19,13/02	8-21 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-0729N-SMB - MCPA 100 ug/kg PCP 4.0 ug/kg. ×5 → 20 ug/kg.
↳ MCPA was NDs in associated samples, ok

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. 8/4/02 All %RSDs or r^2 were in control.
7/22/02 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: C. Cal. 8/5/02 2219 PCP -21.3%/-19.7%, 2,4,5-TP -23.8%/-21.9%, 2,4,5-T -25.4%/-23.4%
~~4516OC-1~~ ~~4520OC-1~~ → 2,4-DB -27.0%/-18.0%
8/6/02 0931 PCP -18.5%/-20.2%, 2,4,5-TP -22.1%/-23.3%, 2,4,5-T -22.2%/-24.2%
2,4-DB -20.1%/-16.2%
~~4521OB-1~~ → 8/13/02 1601 MCPP 17.1%/—, 2,4-DB 18.2%/20.7% ← WJL
8/13/02 2100 All %Ds < 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: Surrogates were diluted out in several samples, (DF=20-2000) ok

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 - 45229B-5. PCP MS=0% MSD=0%. , Dichlorprop RPD=47% (<40%).
① PCP conc in parent sample > 4X spiking conc.) no action was taken.
② PCP contamination.

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 - 0729W-SMB PCP 197% (10-150%)
① Blank contamination

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:

	WASTE-Q-6-COMP	WASTE-Q-6-COMP-Dup	RPD
RCP	12000	8300	36.5%
others	NDs	NDs	/ok

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.: SAII 38
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 1.9 - 5.8°C
only waste samples were provided in this SDG.

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	7/16, 18, 19/02	8/2/02	14-17 days
Hg.	7/16, 18/19/02	8/3/02	15 - 18 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%

r = 0.999935
0.999928 / OK

Note: CRDL.
Al 124% / 136%.
Na — / 69%
Tl 73% / 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.	✓	~~✓~~	NA				✓					
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: See attached

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

(A) no lab dup.

		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 – RPD
Al RPD= 56.9%, Cr RPD=55.8%, Cu RPD=58.8%, Fe RPD=170%
~~Hg~~ Mn RPD= 102.6%, Zn RPD=172.7%

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. Sb MSD=74%, Ca MS=170%, MSD=158%
Cr MSD= 180%, Cu MSD= 186%, Mg MS=147%, MSD=156%.
Mn MS= 167%, MSD= 646%, Na MS=172%, MSD=205%, Zn MS=57%, MSD=320%
Post-digestion Spike - WASTE-Q-4-COMP.-ICP) All %Rs were in control.
WASTE-Q-8-COMP- Hg)

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 - WASTE-Q-4-COMP Zn 12.3%.
WASTE-Q-8-COMP. – Hg original Hg conc < 50X MDL. JK

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: WASTE-Q-6-COMP / WASTE-Q-6-COMP-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 - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII30

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. 5.2°C - 5.8°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 Analyzed.	H.T.
7/22/02	8/5/02	14 days
7/23/02	8/6/02	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 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.
8/1/02 1224 I. Cal
8/5/02 1423) field samples, QC samples.
8/6/02 1750.)

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-20Ø805MB Methylene chloride 1 ug/L
MB-2PØ806MB All NDs.
TB072202 Methylene chloride 1.3 ug/L Styrene 0.37 ug/L
TB072302-1. chloromethane 0.28 ug/L, Styrene 2.3 ug/L

⊛ Styrene was not detected in the associated samples, JK

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) Acetone RRF = 0.0487. ~~J/UJ~~ J/R

8/1/02 Bromomethane ~~%R~~ r^2 = 0.987 All other %RSDs or r^2 were OK.
(MSP5973) ↳ J/UJ

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. 8/5/02 1520. Acetone RRF = 0.03497 %D = -28.2%
(MS0C973)

8/6/02 1804 Bromomethane %D = -23.0%
(MSPC973).

(*) Acetone and bromomethane were flagged due to I. Cal failure, 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-Q-4-80. (S245240-2).
Bromomethane MS = 152% ↑ (40-141%)
Since this compound was not detected in the associated samples,
JK

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-20080SMBLCS All %Rs were in control

LCS-2P0806MBLCS 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:

GW-AA-R-1-~~85~~ 58 DL 1.2-dichloroethane-d4 110796 (47.2%). ↓
S245229-5 (A) (117284-469136)

Since ① acetone was the only one to be used for data interpretation and ② acetone result was previously flagged due to Calibration RRF failure, no additional flags were applied. (B)

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:

	GW-AA-Q-3-80	80-Dup.	RPD
Methylene chloride	1.5 B.	1.4 B	6.9%.
Chlorobenzene	13	12	8%

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: 20

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 6

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

% Completeness = 99.1 %

Note: 6 acetone results were rejected due to calibration RRF failure.

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:
SDG No.: SAII30

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: 5.2°C - 5.8°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	H.T.	Date Analyzed	H.T.
7/22/02	7/25/02	3 days.	8/14,15,16,26/02	20-32 days.
7/23/02	7/26/02	3 days	8/13,14,26/02	18-31 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: 7/22/02 1821, 7/31/02 0731 I. Cal.
8/1/02 0905, 8/2/02 1645, 8/4/02 1114, 8/10/02 1050
8/12/02 2041, 8/13/02 10:00 8/13/02 2351. 8/14/02 0844
8/14/02 1609, 8/16/02 0937, 8/23/02 1024, 8/26/02 1108

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-0725D-GMB All NDs

MB-0726C-GMB 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: 7/22/02 MSG5973. 7/31/02 MSG5973 2,4-dinitrophenol r^2=0.987
8/2/02 MSE5973 All %RSDs and r^2 were in control.
8/2/02 MSE5973 r^2 was in control.
5-2.29-2, -3, -8, -9, -10 — 8/10/02 MSG5973. 2,6-dinitrotoluene r^2= 0.9868, 3-nitroaniline r^2=0.9885
4-nitroaniline r^2=0.9861 (J,V,r)
8/14/02 MSG5973 All %Rs and r^2 were in control. (JA) ≈0.990

6.0 Continuing Calibration

8/23/02 MSG5973 ~~4-nitrophenol r^2= 0.9896~~, PCP r^2=0.9878 J,r r^2=0.988
Butyl benzylphthalate r^2=0.9891, Bis(2-ethylhexyl)phthalate

		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: 8/1/02 0926 MSG5973 2,4-dinitrophenol -23.2%, Indeno(1,2,3-cd)pyrene -25.9%.
MSE5973 → 8/4/02 1258 Dinoseb 21.7%
8/4/02 1205 MSG5973 bis(2-chloroisopropyl)ether -20.9%.
45240-6, -7 — 8/12/02 2088 MSG5973 Hexachlorocyclopentadiene -31.1%, 2,4-dinitrophenol (63.1%) UJ
2,4-dinitrotoluene 29.1%, 4-nitroaniline 22.0%
4,6-dinitro-2-methylphenol 38.7%.
8/12/02 2129 MSE5973 Dinoseb 40.0%.
8/13/02 1016 MSE5973 Hexachlorocyclopentadiene -39.1%, 2,4-dinitrophenol 32.0%
4,6-dinitro-2-methylphenol 25.0%, Indeno(1,2,3-cd)pyrene -21.3%

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:
- GW-AA-R-1-98 (S-2480-8) All base/neutral surrogates were not recovered. but DF=5. J/UJ
- ~~Several~~ Surrogates were diluted out in several samples and their diluted samples DF=10 ~ 500, JX

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 - S245257-3 (?) batch of 0726C.
3,3'-dichlorobenzidine MS=6%, MSD=0% RPD=200%.
4-chloroaniline RPD=81% (<67%).
non-client sample, no action was taken
(*) for batch of 0725D - 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 - 0725D-GMB -

First page missing!

→ LCS- 0726C-GMB 3,3'-dichlorobenzidine 0% (10-144%)
Carbazole 35% (48-127%)

LCS 0726C-GMBRE Bis(2-chloroethoxy)methane 17% (47-110) Carbazole 35%.
4-chloroaniline 9% (10-130)
3,3'-dichlorobenzidine 0%

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:
UJ.n → GW-AA-Q-4-80 (45240-2) Phenanthrene-d10, 459299 ↓ (48.1%), Chrysene-d12 345984 (43.9%)
Perylene-d12 ~~284316 ↓ (43.3%)~~ 192609 ↓ (29.3%)
45240-2 RE Chrysene-d12 353200 ↓ (40.2%), Perylene-d12 288465 ↓ (39.8%).
UJ.n → GW-AA-Q-4-70 (45240-6) Perylene-d12 284316 ↓ (43.3%)
45240-6RE Phenanthrene-d10 339561 ↓ (43.6%), Chrysene-d12 322357 ↓ (36.7%)
Perylene-d12 299318 ↓ (41.3%)
GW-AA-R-1-128 (5240-4) Naphthalene-d8 1878038 ↑ (206.8%), Acenaphthene-d10 1025624 ↑ (208.9%)
J(+) only

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: GW-AA-Q-3-80 / GW-AA-Q-3-80-Dup. trace amount of several target compounds was detected in each sample. JK

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: 18

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 31

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

% Completeness = 97.4%

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:
SDG No.: SAII30

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: 5.2-5.8°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.	H.T.	Date Analyzed.	H.T.
7/22, 23/02 (JA)	7/25/02	3 days	8/4, 16/02	10, 22 days
7/23/02	7/29/02	6 days	8/4/02, 8/16/02	6, 18 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 - 0725Q-RMB All NDs

MB - 0279Q-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. 7/25/02 (SGRZCD) All %RSDs or r^2 were in control.

8/7/02 (SGRZCD) 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: 7/25/02 1321
8/3/02 1910
8/7/02 1925
8/16/02 1120.

All %Bs were in control.

8/16/02 1801 RTX-CLP delta-BHC -17.7%, 44'-DDE -28.0%, Dieldrin 20.3%
44'-DDT -17.3%, Endrin Ketone 15.7%, TCMX -19.8%
DCBP -18.2%.
RTX-CLP2. alpha-BHC -20.3%, delta-BHC -20.5%, Dieldrin 19.1%
Endrin 17.1%

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. 8/3/02 1933. RTX-CLP. Heptachlor -17.6%, Endosulfan I -18.9%, 4,4'-DDT -16.7%
Methoxychlor 17.9%, DCBP -22.0%
45229-2 → RTX-CLP2 DCBP = -19.9%.
-3 8/4/02 0829. RTX-CLP Heptachlor -32.5%, gamma-chlordane -20.2%, alpha-chlordane -17.8%
45240-2 ~~4,4'-DDE -15.4%~~ ≈15%, Endosulfan II -20.4%, 4,4'-DDT -28.3%
Endrin aldehyde -20.1%, Endosulfan sulfate -16.4%, DCBP -31.2%
RTX-CLP2 Heptachlor -36.7%, gamma-chlordane -15.7%, 4,4'-DDT -35.9%
45229-1 Endrin aldehyde -17.2%, Methoxychlor -21.0%, Endrin Ketone -15.8%
45240-1. DCBP -29.3%

7.0 Surrogate Recovery

8/16/02 1142 RTX-CLP delta-BHC -17.4%, 4,4'-DDE -26.6%, TCMX -18.7%, DCBP -22.7%
RTX-CLP alpha-BHC -18.5%, delta-BHC -19.2%, Methoxychlor -15.5%
J. C

		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

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

Note:
45229-2 TCMX 22%/26%
45229-3 TCMX 22%/24%.
45240-2 TCMX 28%/— DCBP 16%/19%.
45229-1 TCMX —/480% DCBP —/17%
45240-1 TCMX —/158%, DCBP 12%/18%.

All results 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 - 45-257-3
alpha-BHC RPD = 43%, gamma-BHC RPD = 32%, Heptachlor RPD = 27%
Aldrin RPD = 27%, gamma-chlordane RPD = 25%, alpha-chlordane RPD = 24%
⊗ Since all results in associated samples were previously flagged due to surrogate recovery failure, 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- 0725Q-RMB (LCS/LCSD) All %Rs and RPDs were in control.
LCS 0729Q-RMB delta-BHC LCS = 50% ↓ (53-137%) → J/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: IS (150.6%)

(*) 45240-2 89308 ↑ (29642-88928)

Since all results in this sample were flagged due to other QC failures, no additional data flags were applied.

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:

	GW-AA-Q-3-80	GW-AA-Q-3-80-Dup.	RL
Endrin Ketone	0.018 ug/L	0.021 ug/L	0.10 ug/L

13.0 Data Completeness

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

13.1.1 Number of samples: (7A) ~~4~~ 5

13.1.2 Number of target compounds in each analysis: 21

13.1.3 Number of results rejected and/or not reported: 1

% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)

% Completeness = 99%

Note: ~~83/84~~ = 104/105

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:
SDG No.: SAII30

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 5.2 - 5.8°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.	H.T.	Date Analyzed.	H.T.
7/22/02	7/26/02	4 days	7/30/02	4 days
7/23/02	7/26/02	3 days	7/30/02	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: 7/26/02 0547
7/29/02 0577
7/30/02 0575

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- 0726B-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 7/26/02 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. 7/29/02 0657 All %Ds < 20%
7/29/02 1449 All %Ds < 20%

7/30/02 0619 All %Ds < 20%
7/30/02 1424 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 - 45257-3. All ~~%RS~~ %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 - 0726B-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).

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: GW-AA-Q-3-80 GW-AA-Q-3-80-Dup

PCBs 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: 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: _____
SDG No.: SAT30

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. 5.2°C - 5.8°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.	H.T.	Date Analyzed	H.T.
7/22, 23/02	7/26/02	3-4 days	8/3/02	8 days
			45229-1DL 8/16/02	21 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 - 0726 N-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. 7/22-23/02 All %RSDs or r^2 were in control.
(GC/ECD) 8/9/02 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: C. Cal. 8/2/02 2307 DB-XLB MCPP 18.9% 2,4-D 15.7%
DB-35MS 2,4-DB -16.9%
8/3/02 0741 DB-XLB MCPP 22.2%, MCPA 16.1%, 2,4-D 15.7%
DB-35MS 2,4-DB -21.5%.
8/16/02 1218 DB-XLB 2,4-DB -23.6%, DB-35MS MCPP -15.7%
8/17/02 0039 DB-35MS Dalapon -15.5%.

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: All surrogate recoveries were in control.

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 - 45257-3
2,4,5-TP MS=105% ↑ (10-100%)
Since MSD %R and RPD were in control, 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 - Dalapon 0% → R.1 (21-97%).
Dichlorprop 24% (27-209%) → R.1
2,4-DB 38% (55-167%). → R.1

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: Due to sample matrix, target compound 2,4-D could not be quantitated for sample GW-AA-R-1-78, see dilution result.

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: Most of positive detections RPD > 40%, 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	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-3-80	GW-AA-Q-3-80-Dup.	Difference	RL
MCPP	11	120 u	11	120
2,4-D	1.8	2.6	0.8	0.5
PCB	0.18	1.0 u	0.18	1.0
			<2XRL	

1K

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: 13

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

% Completeness = 74%

Note: 37/50

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

SDG No.: SAII30
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. 5.0 - 5.8°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	7/22, 23/02	8/2/02	10-11 days
Hg	7/22, 23/02	8/1/02	9-10 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: Allaqueous samples.
5229-1 and 5240-1 were analyzed at a 1:5 dilution for Na.

		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: only in 5229-1, Ca conc > ½ of the conc in ICSA.

Ca → interferent is Mg. ✓ 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:

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.							r = ~~0.799948~~ 0.999948					
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Note: CRDL
Al final 134%
Se final 65%.
Tl initial 127%, final 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.	✓							✓				

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 RPDs → 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 - ~~[illegible]~~ client sample. K MSD = 129%. → J, m
(JA) (In SDG SA ID 9)
(*) Post-digestion spike - GW-AA-R-1-78 (ICP metals) GW-AA-R-3-80 (Na only)
GW-AA-R-1-78 (Hg)
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: ICP Serial dilution - GW-AA-R-1-78
K = 10.4% ≈ 10% m

K results were previously flagged due to MS/MSD recovery failure, m.

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:

	Q-3-80	Q-3-80-Dup		Q-3-80	Q-3-80-Dup		Q-3-80	Q-3-80 Dup
Al	4.7	4.5	Co	0.010U	0.010U	Na	21	21
Sb	0.020U	0.020U	Cu	0.016	0.011	V	0.012	0.010
As	0.010U	0.010U.	Fe	31	31	Zn	0.063	0.063.
Ba	0.48	0.47	Pb	0.0028	0.0050U			
Be	0.00027	0.00023	Mg	45	45	Hg	0.00053	0.00020U
Ca	160	160	Mn	1.1	1.1			0.000055
Cr	0.030	0.030	Ni	0.018	0.018			
			K	9.8	9.8			

Difference > 2XRL

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: 5												
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
___ NJDEP/SW-846
___ NFG/CLP
✓ Project QAPP/SAP
___ Region III/SW-846

Project Name: Sauget Area II
Project Number:
Laboratory: STL-Savannah
SDG No.: SAII30
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 5.0-5.8°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.	H.T.
7/22, 23/02	8/1/02	9-10 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 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.	NA		✓

Notes: I. Cal 6/12/02 FID $r^2 = 0.987$. TCD $r^2 = 0.999942$.
C. Cal. 8/1/02 1004 Methane %D = 13% (FID)
8/1/02 0944 Methane %D = 20% (TCD).

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 - 1C0801MB FID ND (0.19 u)
TCD ND (190 u).

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 - 45257-3 (non-client sample).
Methane MS = 50%, MSD = 50%. (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 - 1C0801MB Methane 88%
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:

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:

	GW-AA-Q-3-80	GW-AA-Q-3-80-Dup.	RPD
Methane	43	24	56.7%.

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:

5229-1, 5240-1, and 5240-2 → Methane conc. greater than linear range on FID, use TCD results.

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 5			
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:
Laboratory: STL-Savannah
SDG No.: SAII30
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 5.0 - 5.8°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.	H.T
7/22/02	7/31/02	9 days
7/23/02	8/1/02	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: Titrimetric Method.

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: 7/31/02 MB - PBW-1 ND (<1.0).
8/1/02 MB PBW-2 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.1 Alkalinity = 90.9%. / N 2273.7/2500.0 = 90.9%

LCS2 94.7%. / N 2366.4/2500 = 94.4%

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: S245203-1 Alkalinity 1889.3/1795.8 mg/L RPD=5.1%

S245-240-1 Alkalinity 1179.1/1097.8 RPD=7.1%

~~GA~~ GW-AA-R-1-131

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: GW-AA-Q-3-80 GW-AA-Q-3-80-Dup. RPD

Alkalinity 557.2 585.7 5.0%

CO_2 65 41 45.3%

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: 5			
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

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.: SAII30
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: 5.0 – 5.8°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	H.T
7/22, 23/02	7/23, 24/02	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/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 = 0.9998, (Nitrite) 7/25/02 r = 0.9999.
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: MB - all ND's
ICB/CCBs 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: NO2 - GW-AH-R-1-78 MS = 102% MSD = 102% - NO2
~~MS = 95.8% MSD = 69.2% - NO3~~ (JA)
NO3 - spike recovries is ~~0%~~ (JA) ~~RPD = 32.2%~~ (JA)
MS = 24%
MSD = 17% RPD = 32.2%

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 97% (LCSW-1)
94%. (LCSW-2)

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: S245261-1 ND/ND ✓ ✓.
S245203-1 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: GW-AA-Q-3-80 GW-AA-Q-3-80-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:_____			
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:
Laboratory: STL-Savannah
SDG No.: SAII30
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: 5.0 - 5.8°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.	H.T.
7/23, 23/02	7/26/02	3-4 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 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/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 - S245257-3.
MS = 108% MSD = ~~118~~ 112% (NA)
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: LCSW-1 99% / N 20.43 / 20.65 = 98.9%
101%

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: S245236-1 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: GW-AA-Q-3-80 GW-AA-Q-3-80-Dup. RPD

SO4 40.486 41.147 2%

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: MHHadle
Date: October 8, 2002
Lab: SR - Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA431

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: 5.3°C, 5.0°C, 5.6°C, 5.8°C, 5.2°C, 5.5°C, 5.7°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
7/22/02	7/31/02	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:

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/M itial 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 7/31 @ 1314
2-butanone 52.8%

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: 2-butanone (35%)

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 > 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:

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 WORKSH[illegible]T - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: Mitchell
Date: October 8, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII31

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
7/22/02	7/31/02	9 days	8/5/02, 8/9/02	5 days 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:

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:

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:

45229A-3DL nitrobenzene-d5 (0%), terphenyl-d14 (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:

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? (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: Mitchadle
Date: October 8, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII31

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 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 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
7/22/02	7/31/02	9 days	8/6/02	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:

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:

8/7/02 @ 02316

aldrin 15.7% - not target compound

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:

0731 P-JMPLCS DCB 28%/25% - QC sample, 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:

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: 45229A-3 49947626/30451489 = 164%

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 WORKSH[illegible] - Level III/IV Review
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: MtHandle
Date: October 9, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII31

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
7/22/02	8/1/02	10 days	8/5/02	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:

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/M[illegible]itial 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: Mubhadle
Date: October 9, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAT31

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

		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
7/22/02	8/2/02	11 days	8/8/02	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 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 8/8/02 @ 1037 8/8/02 @ 2018 8/13 @ 1601

dalapon	22.3% / 17.6%	not target compounds	dalapon	20.5% / 19.1%	not target compounds	MCPP	17.1%
MCPP	18.6% / 19.3%		MCPP	23.1%		2,4-DB	18.2% / 20.7%

not target compds.

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: 45229A-3 DCAAZ 700%
0802N-SFB " 170%

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

Project Name: Sauget Area II
Reviewer: MSShadle
Date: October 9, 2002

SDG No.: SA II31
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 Temps - All 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: 7/22/02

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
- As 138%
Se 132%, 122%

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 - Pb 22.2 ug/L 111 CCB4 As 5.59 27.95 CCB5 Ba 1.26 6.3
Ba 1.47 7.35 Cr 1.91 9.55
CCB2 - As 5.74 ug/L 28.7 Cr 1.70 8.5

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:

Post digestion spike analyzed. No anomalies found.

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 - 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.: SA II 32

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: 5.0°C – 5.8°C. , only soil samples provided in this SDG.
waste samples are provided in SDG: SA II 33.

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
7/22/02	7/26/02	4 days
	7/30/02, 8/5/02	8 days, 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 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:
7/8/02 1445 (MSM 5972) I. Cal.
7/11/02 0857 (MSO 5973) I. Cal.
7/26/02 1031 (MSM 5972)
7/29/02 1731 (MSO-5973) field samples, QC.
8/5/02 0829 (MSO 5973)

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-1M0726MB All NDs (low level)
MB-100805MB (Med-level) All NDs
MB-200729MB (Med-level) 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 7/8/02 (MSM5972) All %RSDs or r^2 were in control RRF > 0.05

I. Cal 7/11/02 (MS05973). All %RSDs or r^2 were in control
Acetone RRF = 0.0487
Associated samples: Soil-Q-11-6DL 7/30/02 — Not used for data interpretation
Soil-Q-12-6 — R. c.
Soil-Q-12-6DL. 8/5/02 — Not used for data interpretation

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: 7/26/02 1056 (MSM5972) Methylene chloride - 41.0%. — All ND's or

Soil-Q-12-6 Soil-Q-11-6DL → 7/29/02 1813 (MS05973) chloroethane - 26.9%, 1,1-dichloroethane 30.8%.
Acetone RRF = 0.04034.

Soil-Q-12-6DL → 8/5/02 0922 (MS05973) 1,1-dichloroethane 50.5%, Tetrachloroethene 26.3%
2-Hexanone - 20.9%, Dibromochloromethane 22.7%
Acetone RRF = 0.04065
1,2-dichloroethane (total) 31.7%
⊗ Surrogate dibromofluoromethane 22.3%.

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.)	[ ]		✓

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?	[ ]	✓	~~✓~~ JA
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: Sample Soil-Q-12-6 was the designated MS/MSD. Due to the abundance of target analytes in the parent sample, it was analyzed at a 1000 times dilution. The spike compounds ~~were~~ would have been diluted-out, therefore, the MS/MSD ~~summary form~~ analysis were not performed.

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 IM0726MB - (Low) 7/26/12 LCS/LCSD - %Rs and RPDs were in control
LCS - 100805MB - (Med) 8/5/12 1,1-Dichloroethane 136% ↑ (51-129%)
LCS - 20 0729MB (Med) - 7/29/12 Acetone 170% ↑ (43-154%)
1,1-dichloroethane 136% ↑ → J, 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 > 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: Soil-Q-11-6 chlorobenzene
Soil-Q-12-6 Toluene, Ethylbenzene, Xylene) exceeded the linear range. - J, g

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-Q-11-0.5 / Soil-Q-11-0.5-Dup. - see next page
chlorobenzene difference > 2XRL)
Xylene RPD = 115%) J, f

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: 1

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

% Completeness = 99.4%

Note:

	Soil-Q-11-0.5	Soil-Q-11-0.5-Dup.	Difference/RPD	RL
Chloroform	1.8	10 U.	1.8	10
Benzene	5.7	10 U.	5.7	10
MIBK	4.3	3.0.	1.3	10
~~TCE~~ PCE (Tetra)	0.96	10 U.	0.96	10.
Chlorobenzene (*)	45	10.	35 >2XRL.	12
Ethylbenzene	5.0	21.	16	12.
Xylene (*).	67	250.	115%	

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.: SAII32

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: 5.0 - 5.8°C, only soil data provided in this SDG. waste data were provided in SDG SAII33.

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
7/22/02	7/30/02	8 days	8/10, 12, 14/02	11-15 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: 8/2/02 1645 I. Cal
8/10/02 1330.
8/12/02 0829) field samples, QC.
8/14/02 1844

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 - 0730A - BMB 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 8/2/02 (MSE5973) 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. 8/10/02 1419 Hexachlorocyclopentadiene -48.9% 2,4-dinitrophenol 54.1% U.J.
2,4-dinitrotoluene 28.0%, 4-nitroaniline 21.1%
4,6-dinitro-2-methylphenol 31.3%.
45-229B-1-2 ~~1448~~ Dinoseb 44.9%
45-229B-5-4-302 8/12/02 0845 Hexachlorocyclopentadiene -27.1%
8/14/02 0900 ~~Bis(2-ethyl~~ Bis(2-chloroethyl)-ether 22.9%,
Hexachlorocyclopentadiene -41.8%.
45-229B-7-102 0933 Dinoseb 35.7%.

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? 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-11-0.5-Dup. 2-fluorobiphenyl 25% ↓ (30-120%) only one out. OK.

Soil-Q-11-6 and Soil-Q-11-6-DL – All surrogates were diluted out. OK DF = 20, 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 - Soil-Q-12-6. Naphthalene MSD = 132% ↑ (25-131%)

Dimethylphthalate 41%/39% N-nitrosodiphenylamine 39%/39%.
Butylbenzylphthalate 49%/51% Benzo(a)anthracene 45%/43%.
chrysene 48%/45%.

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 - 0730A-BMB 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 > 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: Soil-Q-11-0.5 / Soil-Q-11-0.5-Dup

Phenanthrene 113%
Bis(2-ethylhexyl)phthalate 102%) J, f

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: 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.: SAII32

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: 5.0°C - 5.8°C, only soil data provided in this SDG

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
7/22/02	7/29/02	7 days	8/4, 21/02	6, 23 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-0729P-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 7/25/02 (SGRECD) RTX-CLP ~~All %RDs~~ %RSDs or r^2 were in control.
RTX-CLP2 ~~All %RDs~~ %RSDs or r^2 were ok
8/7/02 (SGRECD) RTX-CLP ~~All %RDs~~ %RSDs or r^2 were ok
RTX-CLP2 "

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: 7/25/02 1321
8/3/02 1001
1910
8/7/02 1925
8/21/02 1316

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: 8/3/02 1023 RTX-CLP Methoxychlor 18.7%, Endrin ketone 18.4%, 2,4-DCBA -16.2%.
RTX-CLP2 4,4'-DDT 16.5%, Endosulfan sulfate 17.9%, Methoxychlor 26.5%, Endrin ketone 19.6%.
1933 RTX-CLP Heptachlor -17.6%, Endosulfan I -18.9%, 4,4'-DDT -16.7%, Methoxychlor 17.9%
DCBP -22.0%
4522913-1,2,3,4 → RTX-CLP2 DCBP -19.9%.
8/4/02 0829 RTX-CLP △Heptachlor -32.5%, △gamma-chlordane -20.2%, alpha-chlordane -17.8%
Endosulfan II -20.4%, △4,4'-DDT -28.3%, △Endrin aldehyde -20.1%
Endosulfan sulfate -16.4%, DCBP -31.2%.
RTX-CLP2 Heptachlor -36.7%, gamma-chlordane -15.7%, 4,4'-DDT -35.9%, Endrin aldehyde -17.2%
Methoxychlor -21.0%, Endrin ketone -15.8%, DCBP -29.3%.

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

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

Note:
LCS - 0729P-RMBLCS TCMX 26%/26%, DCBP —/29% QC sample.
All surrogates were diluted out in all field samples, (DF=10-40) VK

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: Sample Soil-Q-12-b was the designated MS/MSD. Due to matrix interference in the native sample, the MS/MSD were analyzed at a dilution of 10. Due to the level of dilution required, spiking compounds were not recovered; therefore, Form III has not been 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

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

Note: LCS - 0729P-RMB - alpha-chlordane 30% ↓ (45-140%)) R/J.
4,4'-DDE 28% ↓ (34-121%).
other LCS %Rs were in control, but at low end of the control limit

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: All samples were diluted at DF = 10 - 40.

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-Q-11-0.5 / Soil-Q-11-0.5-Dup)

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:

Soil-Q-11-6 (TD)	IS	136765 ↑	45574 - 136724	150.04%	OK
Soil-Q-12-~~0.5~~ MS	IS	159627 ↑	(50309 - 150927)	158.6%	) QC samples, OK
Soil-Q-12-~~0.5~~ MSD	IS	162211 ↑		161.2%	
6 (SA)					

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: 4

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

% Completeness = 96.1%

Note: 101/105

	Soil-Q-11-0.5	Soil-Q-11-0.5-Dup.
alpha-BHC	170	200
gamma-chlordane	410	390
alpha-chlordane	53	60
4,4'-DDE	570	560
Dieldrin	400.	350
4,4'-DDT	1500	1400
~~Endrin Sulfate~~		
Endosulfan Sulfate	32	43
Endrin Ketone	110	110.

/ ne

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

Reviewer: TA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII32

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: 5.0°C - 5.8°C, only soil samples provided in this SDG.

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
7/22/02	7/29/02	7 days	8/20, 21/02	22, 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:
8/18/02 0829 I. Cal
8/20/02 0516 LCS
8/20/02 1557 45229B-1 ~ 4
8/21/02 0657 45229B-5, 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 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 - 0729B-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 8/18/02 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 8/20/02 0618) All %Ds <30% (for soil samples)
1445
8/20/02 1738
8/21/02 0037
8/21/02 0806.
8/21/02 1653

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.	(7A) [~~✓~~]	✓	
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-11-0.5, Soil - Q-11-0.5- Dup. Soil -Q-11-6.) DF=10 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 - Soil-Q-12-6.

Trichlorobiphenol	190% / 240%.	(30-130)
Tetrachlorobiphenol	550% / 660%.	(40-140)
Pentachlorobiphenol	890% / 780%.	(40-140)
Hexachlorobiphenol	— / 340%.	(40-140%); RPD = 85%. (<50%)

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 - 0729B-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).

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:

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: 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:

	Soil - IQ - 11 - 0.5	Soil - Q - 11 - 0.5 - Dup.
Di -	110	120
Tri -	1200	1700
Tetra -	3600	4700
Penta -	5600	5500
Hexa -	1900	1400
Hepta -	520	320
Octa -	59	25

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 32

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: 5.0 - 5.8°C , only soil sample results provided in this SDG

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
7/22/02	7/29/02	7 days	8/6/02	8 days
			8/17/02	19 day
			9/5/02	38 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- 0729N-SMB Pentachlorophenol 4.0 ug/kg. vs → 20 ug/kg
All PCP results > 5X blank conc. ok

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 8/4/02 (SGSECD) All %RSDs or r^2 were in control on both columns.

7/22/02 (SGSECD)) All %RSDs or r^2 were in control.
~~8/22/02~~ (SGSECD)

5.0 Continuing Calibration 9/4/02

		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: 8/5/02 2219 DB-XLB PCP -21.3%, 245-TP -23.8%, 245T -25.4%, 2,4-DB -27.0%
452298-2 → DB-35MS PCB -19.7%, 245-TP -21.9%, 245T -23.4%, 24-DB -18.0%
-4 8/6/02 0931 DB-XLB PCP -18.5%, 245-TP -22.1%, 245T -22.2%, 24-DB -20.1%
DB-35MS PCP -20.2%, 245-TP -23.3%, 245T -24.2%, 24-DB -16.2%

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-Q-11-0.5-Dup 2,4-DCAA 629% ↑ (30-189%) on confirmatin column) J(+)
Soil-Q-12-6 2,4-DCAA 360% ↑ ")
Soil-Q-12-6 MS 315% ↑ ") QC OK
Soil-Q-12-6 MSD 337% ↑ "
— Soil-Q-11-0.5 (DF=20), Soil-Q-11-6 (DF=1000) — surrogates diluted out, ok.
Soil-Q-11-0.5-Dup OK (DF=20)

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-Q-12-6 PCB 0%/0% J(+).
Dichloroprop RPD = 47% (<40%)

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 - 0729N-SMB PCP %R=197% (10-150%)

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-Q-11-0.5 DF=20	Soil-Q-11-0.5-Dup DF=1	
MCPP	57000 u.	5200	Difference < 2XRL
MCPA	57000 u	720	"
PCP	2300	3600	
245-T	240 u	7.4	Difference < 2X RL.

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: _____

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
Al Final 124%.
Pb initial 66%
Na initial 75%
Tl initial 138%
Tl initial 127%, Final 121%.
Tl Final 73%

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.		✓						✓	~~✓~~ (7A)			

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: See attached

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: MS/MSD - Soil - Q-12-6
Sb 45% / 45% J/UJ
K 134% / 144% J
Post-digestion Spike - Soil - Q-12-6 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 - Soil - Q-12-6
K 12.3% J in due to MS/MSD recovery failure, 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: Soil-Q-11-05 / Soil-Q-11-05-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 - 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.: _____

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	JA [✓]	✓	
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: 5.0°C – 5.8°C, only waste sample results were provided in this SDG.

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
7/22/02	7/26/02	4 days
	8/5/02	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 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: 7/8/02 1445 I. Cal
7/26/02 1031) field samples, QC
8/15/02 0829

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 - 1Ø8Ø5MB (Med-level) All NDs.
MB - 1M0726MB (Low-level) 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. 7/8/02 (MSM5972). All %RSDs or r^2 were in control.

7/11/02 (MS05973) All %RSDs or r^2 were in control.
↳ 45229C-4DL Acetone RRF ~~>0.05~~ (JA) = 0.0487 ~~UJ, r~~ (JA)

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. 7/26/02 1056. methylene chloride -41.0% — All NDs JK

8/5/02 0922 1,1-dichloroethane 50.5%, Tetrachloroethene 26.3%
2-Hexanone -20.9% Dibromochloromethane 22.7%
↳ 45229C-4DL Total 1,2-dichloroethene 35.7%,
Dibromofluoromethane 22.3%
not used for data interpretation JK. Acetone RRF = 0.04065

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 - 45288-1 (non-client sample.
only 5 spiking compounds (CLP-like).
All %Rs and RPDs were

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 - 7/26 All %Rs were in control.

LCS - 8/5 1,1-dichloroethane 136% ↑ (51-129%)
↳ 45229C-4DL → not used for data interpretation. 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).

		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	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: WASTE-Q-12-4 / WASTE-Q-12-4-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: 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:

	WASTE-Q-12-4	WASTE-Q-12-4-Dup.
2-butanone	5.8	68U
TCE	1.6	1.2
Benzene	12U	1.4
Toluene	12U	4.6
PCE	3.0	2.9
Ethyl benzene	2.0	3.8
Styrene	0.96	1.3
1,2-DCE (total)	25U	3.6
Xylene	12	18

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.: SAII33

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: 5.0 - 5.8°C, ~~the~~ only waste samples provided in this SDG

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
7/22/02	7/30/02	8 days.	8/12/02	13 days
			8/24, 26/02	25, 27 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: 8/2/02 1645 I. Cal. , 8/22/02 1320 I. Cal , 8/25/02 1149 I. Cal
8/10/02 1330 QC
8/12/02 1829 — 45229C-2 45229C-3
8/23/02 1456 — 45229C-1
8/26/02 1136 — 45229C-1DL

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-0730A-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.	(7A) ~~✓~~	[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 8/2/02 (MSE5973). All %RSDs or r^2 were in control. RRF >0.05
8/22/02 (MSE5973) " r^2 (7A) "
8/25/02 (MSE5973). 2,4-dinitrophenol 0.9873 ~~RRF~~ r^2
4,6-dinitro-2-methylphenol ~~RRF~~ =0.9873
Dinoseb r^2=0.9869 (7A)

6.0 Continuing Calibration

4,6-dinitro-2-methylphenol 26.6%
Dinoseb 25.1%

		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 8/10/02 1419 Hexachlorocyclopentadiene -48.9%, 2,4-dinitrophenol (54.1%)
QC 2,4-dinitrotoluene 28.0%, 4-nitroaniline 21.1%
4,6-dinitro-2-methylphenol 31.3%
1448 Dinoseb 44.9%
8/12/02 0845 Hexachlorocyclopentadiene -27.1%
8/23/02 1553 Hexachlorocyclopentadiene -23.9%, 4-nitroaniline 22.2%
8/26/02 1236 2-nitroaniline 30.0%, 3-nitroaniline 29.0%, 2,4-dinitrophenol 31.9%, 4-nitrophenol 21.9%, 4-nitroaniline 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.	[✓]		

	> 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:

WASTE-Q-12-COMP 2-Fluorobiphenyl 24% ↓ (30-120%) only one out, ok

WASTE-Q-11-COMP DF=10) surrogates were diluted out.

WASTE-Q-11-COMP-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 - Soil-Q-12-6 (452290-5) SDG: SAII82.

Naphthalene MSD = 132% Acenaphthylene MSD = 41%.

Dimethylphthalate 41%/39%, N-Nitrosodiphenylamine 39%/39%

Butylbenzylphthalate 49%/51%, Benzo(a)anthracene 45%/43%

Chrysene 48%/45%

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 - 0730A-BMB 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:

	WASTE-Q-12-COMP	WASTE-Q-12-COMP-DUP	RL
Phenanthrene	670	820 ✓	430
Pyrene	530	390 ✓	↓
Bis(2-ethylhexyl)phthalate	5800	5000 ✓	↓

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.: SAII33

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: 5.0°C – 5.8°C, only waste sample results provided in this SDG.

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
7/22/02	7/29/02	7 days	8/28, 29/02	30, 31 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-0729P-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: 7/25/02 (SGRECD) All %RSDs or r^2 were in control.

8/27/02 (SGRZED. 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:

7/25/02 1321 All %Ds were in control
8/3/02 1001
1910
8/27/02 1056
8/28/02 1212
1619

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: 8/3/02 1023 RTX-CLP Methoxychlor 18.7%, Endrin ketone 18.4%, 2,4-DCBA -16.2%

LCS → RTX-CLP2 4,4'-DDT 16.5%, Endosulfan sulfate 17.9% Methoxychlor 26.5% Endrin ketone 19.6

8/3/02 1933. RTX-CLP Heptachlor -17.6%, Endosulfan I -18.9%, 4,4'-DDT -16.7%, Methoxychlor 17.9;
DCBP -22.0%

RTX-CLP2 DCBP -19.9%

MB → 8/4/02 0829 RTX-CLP Heptachlor -32.5%, gamma-chlordane -20.2%, alpha-chlordane -17.8%
Endosulfan II -20.4%, 4,4'-DDT -28.3%, Endrin aldehyde -20.1%

QC samples Endosulfan sulfate -16.4%, DCBP - 31.2%,

RTX-CLP2 Heptachlor -36.7%, gamma-chlordane -15.7%, 4,4'-DDT -35.9%
Endrin aldehyde -17.2%, Methoxychlor -21.0%, Endrin ketone -15.8%, DCBP -29.3.

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

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

Note: 1) 0729P-RMBLCS. TCMX 26%/26%, —/29%

2). Surrogates were diluted out in all waste samples, (DF= 25—100) 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: MS/MSD - Soil-Q-12-6.
Due to matrix interference in the parent sample, the MS and MSD were analyzed at 10 X dilution. Due to the level of dilution required, spiking compounds were not recovered, therefore, summary form has not been 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

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

Note: LCS - 0729P-RMB - ~~gamma~~ JA alpha-chlordane 30% ↓ (45-140%) J/R
4,4'-DDE 28% ↓ (34-121%)

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: See attached several RPDs were in control "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: WASTE-Q-12-COMP / WASTE-Q-12-COMP-DUP.
4,4'-DDE, Endrin aldehyde, Endosulfan Sulfate, Endrin ketone. → J/UJ

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: WASTE-Q-11-COMP. 272798. ↑ (88365 – 265095) 154.4%
(45229C-1). (→ on confirmation column

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: 1

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

% Completeness = 98.4%

Note: 62/63.

	WASTE-Q-12-COMP.	WASTE-Q-12-COMP-Dup.	Difference/RPD	RL
alpha-BHC	8.6 ug/kg	110 U	8.6	110
gamma-BHC	150	42	108	110
Aldrin	130	110 U	130	110
Heptachlor epoxide	300	160	140	110
gamma-chlordane	780	780		
alpha-chlordane	160	62	98	110
Endosulfan I	120	330	210 OK	110
(*) 4,4'-DDE	1200	~~220 U~~	1200	220
Dieldrin	680	920	290 OK	220
Endrin	340	350	10	220
Endosulfan II	560	150	410 OK	220
4,4'-DDT	~~4700~~ 4200	3300		
* Endrin aldehyde	1500	220 U		
* Endosulfan Sulfate	1800	220 U		
* Endrin Ketone	720	220 U		

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 33

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: 5.0-5.8°C, only waste sample results were 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
7/22/02	7/29/02	7 days	8/21/02	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:
8/18/02 0829. I. Cal.
8/20/02 0516. – LCS.
8/20/02 1557 – MB.
8/21/02 0657 – 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 - 0729B-KMB 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.

I. Cal. 8/18/02 (MSK 5972) — 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:

8/20/02 0618
1445
8/20/02 1738
8/21/02 0037.
8/21/02 0800
1685

All %Ds < 30% (for waste samples, VK).

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: 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

Note: Surrogates in waste samples were diluted-out (DF = 10 - 50).

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

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.

Note: MS/MSD - Soil - Q-12-6. (SAII 32).

Tri - 190% / 240%
Tetra - 550% / 660%
Penta - 890% / 780%
Hexa - — / 340% 85%.

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 - 0729B-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).

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:

WASTE-Q-11-COMP	90259	↑	151.4%	— All NDs, ok
WASTE-Q-12-COMP	83300	↑	139.8%	J(+)
WASTE-Q-12-COMP-Dup.	80941	↑	135.8%.	J(+).

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: WASTE-Q-12-COMP/ WASTE-Q-12-COMP-DUP.

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: 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:

	WASTE-Q-12-COMP	WASTE-Q-12-COMP Dup.	RPD
Di-	570	280	68%
Tri-	3700	2200	50.8%
Tetra-	9400	7100	27.9%
Penta-	8500	6600	25.2%
Hexa-	3200	3800	17.1%
Hepta-	1800	1700	5.7%
Octa-	460	480	4.2%
Nona-	200U	37J	—
Deca-	86	190.	75.4%

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.: SAII33

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: 5.0 – 5.8°C, only waste sample results were provided in this SDG.

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
7/22/02	7/29/02	7 days.	8/6/02	8 days
			8/19/02	21 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- 0729N-SMB. Pentachlorophenol 5.3 ug/kg → 26.5 ug/kg
All PCP results > action level, ok

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. 7/22-23/02) All %RSDs or r^2 were in control.
8/22/02
(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: 8/5/02 2219 DB-XLB Dicamba 27.2%, MCPP 25.5%, MCPA 16.2%, Dichlorprop 15.5%
Δ2,4-D 17.8%, 2,4'-DCAA 29.3%
DB-35MS Dalapon -18.1%, Dichlorprop -16.6% 2,4-D -16.4%,
PCP -23.9%, 245-TP -25.5%, 245-T -27.9%, 24-DB -29.5%

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: WASTE-Q-11-COMP DF=200) surrogates were diluted-out, ok
WASTE-Q-11-COMP-DL DF=2500.

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-Q-12-6 PCP MS/MSD = 0% → sample conc > 4X blank conc.
dichlorprop RPD=47%

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 - 0729W-SMB
PCP 254% ↑ (10-150%) J(+).

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:

	WASTE-Q-12-COMP.	WASTE-Q-12-COMP-DUP.	Difference/RPD	RL
2,4-D	9.9 u.	12	12 / NC	9.9
PCP	63	72	13.3% / NC	
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

Project Name: Sauget Area II
Reviewer: JA
Date:

SDG No.: SAII33
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: 5.0-5.8°C, only waste sample results provided in this SDG.

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	7/22/02	8/13/02	22 days
Hg	7/22/02.	8/14/02	23 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 = 0.999679 / ✓

Note: CRDL
Al Final 124%.
Pb initial 66%
Na initial 75%
Tl initial 138%
Final 73%.

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:

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 – RPD. ICP RPDs are ok
Hg RPD = 36.42% ↑ J(+).
Soil-Q-1-6' (in SDG SAI39)

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 – Soil-Q-12-6 (SDG SAI32)
Sb 45%/45% ↓
K 134%/144% ↑
Post-digestion Spike – WASTE-Q-11-COMP. %Rs were in control.
In SDG SAI39 – Soil-Q-1-6'
Hg MS/MSD %Rs → out
RPD = 36.42% ↑ J(+).

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 – WASTE-Q-11-COMP
Zn = 11.0% 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: WASTE-Q-12-COMP / WASTE-Q-12-COMP-Dup.

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: _____												
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.: SAII 34

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: 1.6°C - 5.8°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
7/24/02	8/7/02	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 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.
8/7/02 1117. 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-20807MB - All NDs

TB072402-RSLDup Styrene 2.2 ug/L GW-AA-Q-1-24-Dup styrene 2.2 ug/L

Trip Blank - chloromethane 0.23 ug/L

TB072402-RSL styrene 2.3 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 (MSP.5973). 8/1/02 Bromomethane $r^2 = 0.9872$ (>0.990) J/UJ
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. 8/7/02 1218 Chloromethane -27.6% ~~J.C analyte~~ J.C on trip blank.
Bromomethane -40.9%.
other
Since all positive chloromethane results were flagged "U, ye" at the RL, no additional data flags were applied.

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-UAA-4-30.

2-Butanone RPD=36%, Chloroform RPD=28%, Ethyl benzene RPD=19%
1,1,2,2-Tetrachloroethane RPD=25%, 1,2-dichloroethane (total) RPD=25%.

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 - 2P0807MB 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:

GW-AA-Q-7-34 DF=2 for chlorobenzene.

13.0 Field Duplicate Samples

	Q-7-74	Q-7-74-Dup.	RL
Styrene	1.0 U	2.2	1.0

trip blank contamination

		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:

	UAA-4-20	UAA-4-20-Dup.	RL		Q-7-74	Q-7-74-Dup	RL
Chloromethane	0.27	0.33	1.0	Ethylbenzene	1.0 U	0.84	1.0
CH_2Cl_2	1.0	5.0 U	5.0	CH_2Cl_2	1.0	5.0 U	5.0
				Toluene	0.37	1.0 U	1.0

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: 16

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 34

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: 1.6 °C - 5.8°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
7/24/02	7/29/02	5 days	8/14,15/02	16,17 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: 8/2/12 1645 (MSE5973) 7 Cal
8/14/12 0844) field samples, QC
8/14/12 2125

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- 0729F-BMB. Fluoranthene (1,2,3-cd) pyrene 1.1 ug/L
Dibenzo(a,h) anthracene 1.3 ug/L
Benzo(g,h,i) perylene 1.5 ug/L

GW-AA-Q-7-84) U.2 at the RL
-Q-7-34)

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 8/2/02 (MSE 5973) 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 8/14/02 0900 Bis(2-chloroethyl)ether 22.9%, Hexachlorocyclopentadiene -41.8%
0933 Dinoseb 35.7%

8/14/02 2224 Bis(2-chloroethyl)ether 24.6%, Hexachlorocyclopentadiene -41.2%
Nitrobenzene-d5 21.7%
2253 Dinoseb 24.9%

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.	[ ]		✓

	> 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 UAA-4-30. 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 - 0729F - BMB 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:

	UAA-4-20	UAA-4-20-Dup	Q-7-74		Q-7-74-Dup
SVOC	All NDs	All NDs.	2,4-dichlorophenol	1.2	10 u
			others	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: 16

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 34

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 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note:

Cooler Temp: 1.6°C - 5.8°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
7/24/02	7/29/02	5 days	8/2, 3/02	4-5 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 - 07290 - 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 8/1/02 All %RSDs or r^2 were in control on both columns (SGI ECD)

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:

8/1/12 1621 All %Bs were ok

8/2/12 1511 All %Bs were ok

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 8/2/02 1536 RTX-CLP 2,4-DCAA -16.6%
RTX-CLP2 Heptachlor 20.1%, 2,4-DCAA -16.8%, TCMX -23.0%
DCBP -21.8%

8/3/02 0254 RTX-CLP 2,4-DCAA -17.5%
RTX-CLP2 Heptachlor 31.4%, 2,4-DCAA -19.6%, TCMX -22.7%
DCBP -18.2%.

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: 07790-1MBLCS DCBP 22%/18% ↓ (30-150%) QC sample.

GW-AA-Q-7-24 DCBP 15%/13% ↓ J/UJ
GW-AA-Q-7-64 TCMX —/24%, DCBP 14%/10%. J/UJ
GW-AA-UAA-4-20 Dup. DCBP —/28% 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: MS/MSD – GW-AA-UA-4-20.
alpha-BHC RPD = 43%, gamma-BHC RPD = 32%, Heptachlor RPD = 27%
Aldrin RPD = 27%, gamma-chlordane RPD = 25%, alpha-chlordane RPD = 24%

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 – 07290-JMB – 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: GW-AA-0-7-64 Heptachlor RPD=50%, 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: GW-AA-UAA-4-20 GW-AA-UAA-4-20-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: 4

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: TA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 34

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: 1.6 °C - 5.8 °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
7/24/02	7/31/02	7 days	8/5/02	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:
7/26/02 0547 (MSK5972) I.Cal.
8/2/02 0949 QC sample
8/5/02 0534 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 - 0731C-KMB 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.

I Cal. All %RSDs were in control.
7/26/02 (MSK5972)

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. 8/2/02 1050.
2041
8/5/02 0733
1654

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 - GW-AA-UAA-4-60 (SAT36).

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 - 0731C-EMB. 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: GW-AA-UAA-4-20 GW-AA-UAA-4-20-DUP.

PCBs 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: 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:

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 34

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: 1.6°C - 5.8°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
7/24/02	7/30/02	6 days	8/6,7/02	7,8 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 - 0730P-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. 8/4-5/02 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:

8/6/02 2025 (SGS ECD) DB-XLB All %Ds < 15%
DB-35MS MCPA %D = 15.5%
8/7/02 0836 DB-XLB Dalapon 25.3%, MCPA 23.6%.
DB-35MS Dalapon 18.4%, MCPP -15.8%, MCPA 18.8%.

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 - SW-AA-UAA-4-601 (SDG: SAI36).
All %Rs and RPDs were in control.

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 - 0730P-SMB. PCB = 145% ↑ (11-110%)
All ND's 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: GW-AA-Q-7-64 2,4-D. RPD=6.4%. /JK.

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: GW-AA-UAA-4-20 GW-AA-UAA-4-20-Dup

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.: SAII 34
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. 1.6°C - 5.8°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.
Tcp	7/24/02	8/10/02	17 days
Hg	7/24/02	8/1/02	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 (80-120%)
Pb initial 124% ↑
Na initial 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: 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:

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 - RPDs OK

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 - GW-AA-UAA-4-60 (SAII36). All %Rs and RPDs were in control.
(ICP) GW-AA-UAA-4-60 Filtered (SAII36).
MS/MSD - AA-GWM-S2-60FT (SAII29) for Hg. - All %Rs and RPDs were OK
Post-digestion Spike - GW-AA-Q-7-24A 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-Q-7-24.

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.: SAII 34
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: 1.6°C – 5.8°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
7/24/02	8/1/02	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 FID $r^2 = 0.987$ TCD $r^2 = 0.9999$
C. Cal. 8/1/02 FID %D = 13%
TCD %D = 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: MB - IC 0801 MB 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-UAA-4-20.
MS = 50% MSD = 52% (75-125%)
RPD = 0% (<30%)

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 - 1C0801MB

FID Methane 88%

TCD 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:

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:

	UAA-4-20	UAA-4-20-Dup	RPD
CH4	33	6.9	130.8%

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-AA-Q-7-64 Methane conc in FID exceeded the linear range use TCD result

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.: SAII34
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: 1.6 - 5.8°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
7/24/02	8/7/02	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?	✓		
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% 156.1/153.0

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 S245-273-1 SW-AA-Q-7-24
578.4/552.4 RPD = 4.6%

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:

	UAA-4-20	UAA-4-20-Dup.	RPD
Alkalinity	430	420.	
CO_2	42	36.	

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.: SAII34
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: 1.6°C - 5.8°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
7/24/02	NO_2	7/26/02	2 days
	NO_3-N	7/31/02	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. 7/26/02 - NO_2 r = 0.9996, 7/31/02 · NO_3 - r = 0.9999.
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.

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-UAA-4-60 (SAII36)
NO_3-N MS = 47%, MSD = 44%. UJ,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: LCSW-1 97%. 0.486/0.5 = 97.2%.
LCSDW-1 105% /uc 0.524/0.5 = 104.8%

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: S245-316-3 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: AA-UAA-4-20 AA-UAA-4-20-Dup

NO3-N ND ND

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: 4			
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
- ___ 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.: SAII34
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: 1.6°C - 5.8°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
7/24/02	7/29/02	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: I. Cal 7/23/12 $r^2 = 0.9991$.
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 - GW-AA-UAA-4-60. (SAII 36)
MS = 96%, MSD = 97%
RPD = 0.65%

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-1 100%. 20.587/20.60 = 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:

S24E354-1 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: AA-UAA-4-20 AA-UAA-4-20-DUP

~~S04~~ 37.854 mg/L 37.564 mg/L

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: 4			
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: 10/2/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: ~~SII~~ 36

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: 4.6, 5, 5.8, 4, 3.9, 4.2

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	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 Analyzed	HT
7/25/02	8/8/02	14

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for 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: Trip blank, TB072502-RSL chloromethane 0.34 ug/L
ethylbenzene 0.68 u

POCs < 5 x1 ug/g or ug/L out 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 8/1/02 bromomethane r 0.957 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 8/7/02 chloromethane % D -35.2
pos. prev. flagged for +P3 cont. normal ✓

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:

Chloromethane MS%R = $\frac{37}{50} \times 100 = 74\%$ ✓

Ethylbenzene MSD %R = $\frac{47}{50} \times 100 = 94\%$ ✓

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: Chloroform than LCS = $\frac{31}{50} \times 100 = 62\%$.

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: Sample calculation toluene GW AA-QAA-4-60
2861 x 250 = 1.797 ✓
434265 x .91632

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-6-24, 24-DUP

acetone	61	53	%RPD 14% ✓
benzene	490	460	6%
toluene	66	70	6%
ethylbenzene	58	64	10%
[illegible]	[illegible]	[illegible]	4%

GW-AA-Q-6-34		-DUP	%RPD
benzene	12000	12000	0%
toluene	52	49	5.9%

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: 10/23/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA-II 36

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: 4.9, 5.1, 5.2

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
7/25/02	7/30/02	5	8/10/02	11
			8/12/02	13
			8/13, 16/02	14, 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: MB indeno(1,2,3-cd)pyrene 0.7 → 3.5
dibenzo(a,h)anthracene 0.58 → 2.9
benzo(g,h,i)perylene 0.65 → 3.25

POS < 5 x 0.2 of 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 8/10/02 2,6-dinitrotoluene 0.986
3-nitroaniline 0.988 all ND UJ/R
4-nitroaniline 0.986 in app. 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 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 8/13/02 2,4-dinitrophenol 25.5%
no pos, 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:
GW-AA-UAA-4-70 2-fluorobiphenyl 35% < 36% no action
GW-AA-Q-6-24DL(DF=4) 3 BNA diluted out - J, UJ, S
GW-AA-Q-6-24-DUPDL(DF=4) terphenyl-d14 diluted out J, UJ, S
GW-AA-Q-6-34DL (DF=4) " " "
GW-AA-Q-6-24-DUPFILTERED DL (DF=4) " "

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:
Pheno MS%R = $\frac{57}{100} \times 100 = 57\%$ ✓
2-Nitroaniline MSD%R = $\frac{75}{100} \times 100 = 75\%$ ✓

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: Chrysene % R = 110/100 x100 = 110%.

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: Sample calculation
GW-AA-OAA-4-60 Chrysene = $\frac{23829 \times 40}{1415216 \times 1.0368}$ = .6499 ✓

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: 2-methylnaphthalene & phenol exceeded → 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-6-24~~ See attached
~~Phenol 10 U~~
~~2,4-dichlorophenol 9.4~~
~~naphthalene 120~~

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: 10/23/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No. ~~SAT~~36

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: 4.6, 5, 4.8, 4.2

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

		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
7/25/02	7/30/02	5	8/19/02	20

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

alpha-BHC J/UJ/R in all samples
endrin
4,4-DDT
methoxychlor

pos J/C for other compds-

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: MS calculation → alpha-BHC → 0.032/0.1 X 100 = 32%
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

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

Note: Lindane Y.R = .056/.1 X 100 = 56%
alpha-BHC LCS/LCSD < QC (46-131) at 43/38 ND → R, l in GW-AA-UAA-4-600, POS. prev flagged due to calib. failure-
414-DOE LCSD 42% < 48) NDs → R, l - POS prev flagged due to calib-
RPD 49% > 18%.

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 sample 2 → (10/1,000)(1000)(1)(0.056) = 0.56 ✓
several >40% → Jcg lab reported the lower result ✓

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:

	GW-AA-Q-6-24	RL	-24 Dup	
alpha-BHC	0.56	.05	.64	OK ✓
Lindane	0.17		.19	✓
heptachlor	0.13		.23	✓
heptachlorepoxide	0.02		.02	✓
gama-chlord	0.027		.024	✓
alpha-Chlor.	.015		.018	✓
DDE	.019		.10	✓
DDD	.029		.027	✓
DDT	.029		.03	✓
Endrin ketone	.10		.014	✓

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: 3

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

% Completeness = 95%

Note: _____

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

Reviewer: RA
Date: 10/23/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA1136

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, 4.2, 4.9, 5.8,

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
7/25/02	7/31/02	6	8/2/02	2

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: monochlorobiphenyl MS %R = $\frac{1.1}{2}$ x100 = 55% ✓

decachlorobiphenyl MSD%R = $\frac{8.7}{10}$ x100 = 87% ✓

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: octachlorobiphenyl LCS = $\frac{4.7}{6} \times 100 = 78\%$

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: GW-AA-Q-6-24 -24 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 = 100

Note: _____

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

Reviewer: RA
Date: 10/24/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII36

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: 4.8, 4.9, 5.2, 5.8

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

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
7/29/02	7/30/02	5	8/7/02	8

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 MCPA → J, C pos, UJ, C ND ~~[illegible]~~

dalapon NDS → UJ, C in all.

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: Dalapon MS %R = 3/4 x 100 = 75%
Dalapon MSD %R = 3.1/4 x 100 = 78%

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: Pentachlorophenol 145 > 11-110 No pos, no action

2,4-DB %R = 4.3/4 x 100 = 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: sample 2: MCPA = Vt/Vo x A x E x Cpd variable
= 10/500 (1000) (.95462) = 19 ✓

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: GW-AA-0-6-24 -DUP
MCPA 19 120 U OK ✓

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 = 100

Note: _____

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

SDG No.: SAII36
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 10/24/02

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
7/25/02 8/7/8, 19/20/02 ICP
" 8/10/02 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: CRDL initial lead 124, sodium 66, 76%
Final CRDL Sodium 78, Thallium 67
minor, 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.	✓							✓				

MB pos. al, copper, zinc
neg. calcium, thallium
al 75x
NDs → UT, P in
al → .238
cu → .0047
zinc .0214
pos < 5x → U, P at RL

		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, CCB → neg ⇒ As, Ca, Mg, Tl

ICB, CCB, pos, Se, Mn, Al, Ba, Tl, Ca, Mg

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: Al MS/MSD 140/140
Potassium 128/126%
> QC Pos → J,M unless prev. for filtered samples

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:
Al S.D 22.6% → J/S [redacted]

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: 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: _____												
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 = 100												

Note:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/24/02
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.: SAII 36
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: 4.8, 5, 5.2, 4.9

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
7/25/02	8/7/02	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/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 r 0.986 < .990 all 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: No MS/MSD %R calculated ok since sample conc. 74x spiking conc.

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: GW-AA-Q-6-24 -DUP RPD
320 240 28 ✓

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: Exceeded calib range in all samples FID detector, all prev. flagged calib failing
no more action
use results from TCD ✓
sample 1 calculation: DF x Vt/Vo x cpd variable
= 1 x 1/1 x 439.66 = 440 ✓

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: 10/24/02
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.: SAII36
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: 4.8, 5.2, 5.9

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	
7/25/02	7/26/02	1	NO3, CO2
"	7/29/02	4	SO4
"	8/7/02	13	alkalinity

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: Na3 %R = 1215/12 X100 = 107% ✓

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:

GW-AA-Q-6-24 DUP
CO2 77 38 67% RPD J,F in these samples
Alk 480 480 0% RPD

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.: SAII37

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: 3.2 °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
7/26/02	8/8,9/02	13,14 days
7/29/02	8/8,9,10/02.	10-12 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: 8/1/02 1224 (MSP5973) I. Cal.
8/8/02 0945) field samples, QC
8/9/02 2018)

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- 1P0808MB All NDs
MB- 2P0809MB All NDs.

Trip Blank Styrene 2.3 ug/L — NDs in associated samples, OK.

Trip Blank - TB072902-RSL Chloromethane 0.18 ug/L ↳ U,y at RL Benzene 0.29 ug/L ↳ U,y 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 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 (MSP5973). Bromomethane r^2 0.987 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:

C.Cal. 8/8/02 1013 Bromomethane -38.8%, Acetone 20.5% → J(+)

8/9/02 2103 Chloromethane -27.2%, Bromomethane -26.3%

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.)	[ ]		✓

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-BA-0-6-54.
Benzene 0%/20% ↓ (62-135%).
Since benzene conc in parent sample was greater than 4X spiking conc.
OK.
LCS %R for benzene is 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-1P0808MB) All %Rs were in control.
LCS-2P0809MB)

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: 13

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.: SAII37.

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: 3.2-5.9°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
7/26/02	8/1/02	6 days	8/5, 15, 29/02	4, 14, 28 days
7/29/02.	8/1/02	3 days	8/15, 28/02	14, 27 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:
8/2/02 1645 I. Cal. (MSZ5973)
8/5/02 0907) field samples, QC
8/15/02 1111
8/27/02 1411 I. Cal. (MSZ5973).
8/28/02 1421. 8/29/02 0902. — 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 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-0801C-ZMB ALL WDS

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 8/2/02 All %RSDs or r^2 were in control. RRF ≥0.05
8/27/02 All %RSDs or r^2 were in control. RRF ≥0.05

6.0 Continuing Calibration

(*) All ND's in associated samples, no data qualifying action was taken.

		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: (*) 8/5/02 1015 2,4-dinitrophenol -33.3%, 2,4-dinitrotoluene -20.5%, 4,6-dinitro-2-methylphenol -26.0%.
1044 Dinoseb -24.8%
(*) 8/15/02 1129 Bis(2-chloroethyl)ether 25.7%, Hexachlorocyclopentadiene -44.2%
2,4-dinitrophenol 24.6%,
1200 Dinoseb 41.9%.
(*) 8/28/02 1438 Bis(2-ethylhexyl)phthalate 24.8%
MS/MSD → 8/29/02 0919 2,4-dinitrophenol -26.2%. 4,6-dinitro-2-methylphenol -23.4%. Dinoseb -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? 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- GW-AA-Q-6-54 3,3'-dichlorobenzidine 2%/ 0% (10-144)
Nitrobenzene MSD = 48% (50-111%)
24 RPDs were greater than the ~~tpy~~ acceptance limits

GW-AA-Q-6-54RE 3,3'-dichlorobenzidine 3%/ 6% ←
Nitrobenzene MSD = 49%
27 RPDs were greater than the acceptance limits.

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 - 0801C-3MB 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:

GW-AA-Q-6-54MSRE Chrysene-d12 769742 ↑ 264.2% (145612-582448)
Perylene-d12 730394 ↑ 262.4% (139183-556732)

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: 16

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 16

% 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.: SAII 37

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: 3.2 - 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 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
7/26/02	7/31/02	5 days	8/6/02	6 days
7/29/02	7/31/02	2 days	8/6,7/02	6,7 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-0731P-JMB 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 8/5/02 (SGJZCD) 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:

8/5/02 1019) All %Ds were in control
8/6/02 1403

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: 8/6/02 1428 RTX-CLP All %Ds <15%
RTX-CLP2 TCMX -17.6% (surrogate)
8/7/02 0236 RTX-CLP Aldrin 15.7%
RTX-CLP2 TCMX -19.3% (surrogate).

⊛ Aldrin result in GW-AA-Q-6-64 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?	[•]	✓	
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: GW-AA-UAA-4-100 DCBP —/28%. JL only one out
GW-AA-Q-6-110 DCBP 24%/22%.
GW-AA-UAA-4-113 DCBP 26%/22%
GW-AA-Q-1-50 DCBP 20%/14%
J/UJ
0731P-JMB DCBP —/20% JL only one 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: No MS/MSD designated in this SDG for pesticide analysis -

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 - 0731P-JMB. 4,4'-DDE RPD=20% (<18%)
① both LCS and LCSD %Rs were in control
② 4,4'-DDE was not detected in associated samples

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: All positive detections had RPDs <> 40%, J, g except previously 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: 6

14.1.2 Number of target compounds in each analysis: >1

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.: SAII37

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: 3.2-5.9°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
7/26/02	7/31/02	5 days	8/5/02	5 days
7/29/02	7/31/02	2 days	8/5/02	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: 7/26/02 0547 I. Cal
8/2/02 0949 QC samples
8/5/02 0534 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 - 0731 C - 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 7/26/02 (MSK5972) 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: 8/2/02 1050) All %Ds < 20%
2041)

8/5/02 0733) All %Ds < 20%
1654)

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.		[ ]	✓

Note:

No MS/MSD designated in this SDG for PCB analysis

Use GW-BA-UAA-4-60 (in SAII 3 6) 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- 0731C-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).

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: 6

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.: SAII37

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: 3.2-5.9°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	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
7/26/02	8/1/02	6 days	8/6/02	5 days
7/29/02	8/1/02	3 days	8/5-6/02	~~4~~-5 days
			TA	TA

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	✓	[✓]	(NA)
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-080IN-SMB. Pentachlorophenol 0.24 ug/L
Positive PCP 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 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 8/4/02 (SGSECD) 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: 8/5/02 0932 All %Ds < 15% on both columns
8/6/02 0931 PCP -18.5%/-20.2%, 2,4,5-TP -22.1%/-23.3%,) J/UJ
245-T -22.2%/-24.2%, 2,4-DB -20.1%/-16.2%
all field samples → 8/6/02 2025 DB-XLB - All %Ds < 15%
DB-35MS MCPA 15.5% ← All NDs, 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: GW-AA-Q-1-50 2,4-DCAA 275%/— J(+).

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 designed in this SDG for Herbicide Analysis. See LCS/LCS.

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: Positive detections in GW-BA-Q-1-50 have RPDs > 40%, J, g, except -

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: 6

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.: SAII37
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. 3.2°C - 5.9°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	7/26, 29/02	8/15/02	17 - 20 days
Hg	7/26, 29/02	8/10/02	12 - 15 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
Fe initial 79%, Final 79%.
Pb Final 124%.
Se initial 123%, 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.	✓	~~✓~~	(NA)					✓				
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 results in associated samples were less than ½ of ICSA conc. JK

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 – GW-AA-Q-6-64 (ICP metal) All RPDs were ok
LCS/LCSD – All % ~~RSP~~ RPDs were ok.
2 MS/MSD – for Hg RPDs were ok

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 - GW-AA-Q-6-64. For ICP only
Al 184% / 156% ↑. J(+) only
K 127% / —
Na 129%
⊛ Post-digestion spike recoveries 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-Q-6-64 for ICP
GW-AA-UAA-4-100-7 for Hg
GW-AA-UAA-4-100 for Hg

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												
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.: SAII37
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: 3.2 – 5.9°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
7/26/02	8/7/02	12 days
7/29/02	8/7/02	~~10~~ 9 days

JA

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: 6/12/02 FID r^2 = (0.9866) (0.987). ⊛ TCD r^2 = 0.9999 /vk
8/6/02 1325 FID 24.9%. TCD 14.5% /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 - 1C0806MB 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 - non-client sample
Methane MS = 66% ↓ MSD = 74% ↓ (75-125%)
⊛ Sample GW-AA-Q-6-64 was the designated MS/MSD. Due to limited sample volume, a batch specific MS/MSD was performed.

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 - 1C0806MB. FID 75% (75-125%)
TCD 96%

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? JA	~~✓~~	✓	
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-AA-Q-6-64, GW-AA-Q-6-110, GW-AA-Q-6-104 → Methane conc's in FID were greater than the linear range, use TCD conc.

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.: SAII37
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: 3.2 - 5.9 °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
7/26/02	8/1/02	6 days
7/29/02	8/9/02	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:

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 (8/1/02) <1.0
PBW-2 (8/9/02) <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:

8/1/02 LCS-1 %R=94.7% 2366.4/2500 = 94.66%

8/9/02 LCSW-2 %R = 108.6% 166.1/153.0 = 108.56%.

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-6-110. Alkalinity 452.3/452.3 RPD=0.4

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:

All Alkalinity result → 5X dilution

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: 12			
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.: SAII37
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: 3.2 - 5.9°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	
7/26/02	7/31/02	5 days	NO_3-N.
7/29/02	7/31/02	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: NO3-N 1. Cal 7/31/02 r = 0.9999. NO2 1 cal. 7/27/02 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
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 - NO3 - GW-AA-Q-6-110. MS = 99%, MSD = 98% RPD = 1.8%.

MS/MSD - NO3-N GW-AA-Q-6-64 MS = 40%, MSD = 41%. → J/UJ.

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: NO_3-N LCS/LCSD 114%/114%.

NO_2 LCSW-1 103%
LCSW-2 109%/— 0.5431/0.5 = 108.62%.

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-1-50. NO_3-N ND/ND.

GW-AA-UAA-4-113 NO_2 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: 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.: SAII37
Test Name: 504
Method No.: 3754

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: 3.2-5.9°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
7/26/02	8/2/02	7 days
7/29/02	8/2/02	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 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/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.

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 – S245370-3 — non-client sample
SO4 MS = 68%. MSD = 68%
RPD = 0.06%.

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%
LCSW-2 101%

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: S245370-5 37.622 / 37.478 RPD = 0.38%
↳ 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

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII38

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	JA [✓]	✓	
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: 3.2°C - 5.6°C

⊗ COCs in this SDG were not provided. (wrong COC). – see COC in Pesticide fraction

⊗ only TCLP results in this SDG.

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	TCLP Extraction	Date Analysed	HT
7/26/02	8/5/02	8/9/02	4 days
	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 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: 8/6/12 0809 (MSA5973) I. Cal
8/9/12 0856. 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 - TCLP Blank All NDs. (0805T)
MB - IA0809MB 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 8/5-6/02 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. 2-butanone %D = -32.2%.
8/9/02 0951

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 - WASTE-Q-9-8 → 2-butanone RPD = 42%
WASTE-Q-10-8
↳ 2-butanone RPD = 43% (<31%)

① Since MS and MSD percent recoveries were OK
② NDs in associated samples,

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 - 1A0809MB 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:

	WASTE-Q-9-8	WASTE-Q-9-8-Dup.	Difference	RL
Benzene	0.0053 mg/L	0.0032 mg/L	0.0021 mg/L	0.020 mg/L
others	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: 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:

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.: SAII38

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	JA [✓]	✓	
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: 3.2°C - 5.6°C

① COCs were not provided (wrong COC in SVOC fraction, see COC in Pesticides)
② only TCLP results provided in this SDG.

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
	TCLP	TCLP		
7/26/02	7/31-8/1/02	5 days. / ✓		
	Extraction 8/1/02	0 days. /	8/15-16/02	14-15 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: 8/14/02 1609 I. Cal
8/15/02 0813) field samples, QC
8/16/02 0937

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: Fluid Blank - 0801B-GFB 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. 8/14/02 All %RSDs or r^2 were in control, All RRF ≥0.05 (MSG 5-973)

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 8/15/02 0833. All %Ds <20% All RRF ≥0.05
8/16/02 1030. 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: WASTE-Q-1-COMP-T Nitrobenzene-d5 / 2-Fluorobiphenyl – 0%
DF=5 → J/UJ – all ~~abs~~ base/neutral result

WASTE-Q-1-COMP-T DL – All base/neutral and two acid surrogates → 0%
DF=10, 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 – WASTE-Q-10-COMP-T
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 - 0801B-GFB. 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:

	WASTE-Q-9-COMP-T	WASTE-Q-9-COMP-T-DUP	Difference
2,4,6-Trichlorophenol	~~0.034~~ 0.05 U	0.034	0.034 < RL
others	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: 4

14.1.2 Number of target compounds in each analysis: 13

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.: SAII38

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: 3.2 - 5.6°C

⊗ only TCLP data provided in this SDG

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
	TCLP			
7/26/02	7/31 - 8/1/02	5-6 days.	8/10/02	9 days
	Extraction			
	8/1/02	0 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 - 08010-1 FB. (Fluid Blank) All NDs

MB - 08010-1 MB. 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 8/8-9/02 RTX-CLP, RTX-CLP2 → 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:

8/8/02 1906 } All %Ds were in control

8/9/02 2144

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. 8/9/02 2209 RTX-CLP. 2,4-DCAA −16.0%, TCMX −16.7%
(SGI ECD) RTX-CLP2 alpha-BHC −33.0%, delta-BHC −30.2%
4,4'-DDE −28.9%, TCMX −23.0%, DCBP 28.2%

8/10/02 0811 RTX-CLP 4,4'-DDT 16.0%, 2,4-DCAA −20.6%, TCMX −21.0%
RTX-CLP2 alpha-BHC −32.8%, delta-BHC −29.4%,
4,4'-DDE −29.9%, 2,4-DCAA −17.3%, TCMX − −23.6%
DCBP −20.2%.

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?	TA [~~✓~~]	✓	
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: 08010-1MB DCBP −/26%. ↓ (30-150%)) QC samples. JK
08010-1MBLCS DCBP >2%/18% ↓

WASTE-Q-1-COMP-T TCMX −/16%, DCBP 27%/11%. TA ~~J/UJ~~. UJ's
All ND'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: MS/MSD - WASTE-Q-10-COMP-T 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 - 08010 - 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: All ND's

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 in associated samples.	[ ]	"	✓
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: WASTE-Q-9-COMP-T WASTE-Q-9-COMP-T-Dup
All results NDs 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: WASTE-Q-1-COMP-T (RTX-CLP2) Bromonitrobenzene 264557 ↑ 38216-114646 346.1%
① NDs in ~~associa~~ this sample, 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: 4

14.1.2 Number of target compounds in each analysis: 7

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.: SAII38

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: 3.2°C – 5.6°C

(Y) only TCLP data provided in this SDG.

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
	TCLP			
7/26/02	7/31-8/1/02	5-6 days	8/23/02	22 days
	Extraction			
	8/1/02	0 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.

8/23/02 1641 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 - 0801D-KFB 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.

8/23/02 (MSK5972). All %RSDs were OK

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 8/23/02 1741 All %Ds <20%
8/24/02 0141 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 - WASTE-Q-10-COMP-T 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-0801D-ICFB 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: WASTE-Q-9-COMP-T WASTE-Q-9-COMP-T-Dup

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: 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:

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.: SA II 38

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: 3.2°C – 5.6°C

(*) TCLP data in this SDG.

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
	TCLP		(TA)	(TA)
7/26/02	7/31, 8/1/02	5, 6 days	8/8, 8/02	8, 6 days
	Extraction.		9/5/02	34 days!
	8/2/02	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 - 0802N - SFB (Fluid Blank) All NDs.
MB - 0802N - 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 8/4-5/02 All %RSDs < 20%
8/9/02 All %RSDs < 20%
9/4-5/02 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: 8/7/02 2324 (8/8/02 1037, 8/8/02 2018 → fluid blank. — 2,4D, 2,4,5-TP %Ds <15%, 2,4-DCAA OK.
8/13/02 0358, 8/13/02 1601 → 2,4D, 245-TP, 2,4-DCAA → %Ds <15%.
8/16/02 1107 2,4-D 16.4%/20.3%, 2,4,5-TP 16.2%/19.1%
S/ALSD OK 8/17/02 0039, OK 9/5/02 0234 2,4-D —/17.8%
9/5/02 1235 All %Ds <15%.
WASTE-Q-1-COMP-T 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:	WASTE-Q-1-COMP-T	2,4-DACC.	—/0%	J/R
	WASTE-Q-1-COMP-T DL	2,4-DACC	0%/0%	DF=10, JR

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 - WASTE-Q-10-COMP-T. All %Rs and RPDs were in control			

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 - OBUZN-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:

	WASTE-Q-9-COMP-T	WASTE-Q-9-COMP-T-DUP.	Difference	RL
2,4-D	0.025U	0.028	0.028	0.025
245-TP	0.025U.	0.025U	—	

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: 2

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 38
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: 3.2°C - 5.6°C, only TCLP data provided in this SDG.

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 TCLP Extracted.		Date Analyzed.	H.T.
ICP	7/26/02	8/7/02	→ 12 days.	8/9/02	2 day
Hg.	7/26/02	8/7/02	→ 12 days	8/20/02	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: _____

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: Se PB -72.8 ug/L. → UJ, P

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%)												
	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 - WASTE-Q-10-COMP-T.

Pb MS = 1328%, MSD = 1327%. J, m

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: ICP Serial Dilution - WASTE-Q-1-COMP-T.

All %Ds < 10%

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:

	WASTE-Q-9-COMP-T	WASTE-Q-9-COMP-T-Dup.	RPD/difference.	RL
Ba	2.2	2.3		
Cd	0.21	0.25	0.04 mg/L.	0.2.
(*) Pb	0.37	0.82	(0.45) mg/L	0.2
others	NDs	NDs.		

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: Mitchadle
Date: October 18, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII39

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: 5.6°C, 5.1°C, 4.9°C, 5.9°C, 3.2°C, 4.6°C, 4.2°C, 5.0°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
7/26/02	8/5/02	10 days
	7/31/02	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:

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: ICAL - 7/11 MSD5973
acetone RRF 0.0487 J|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: CCV 8/5 @ 0922 MSD5973
1,1-dichloroethane 50.5%
PCE 26.3%
2-hexanone -20.9%
dibromochloromethane 22.7%
1,2-dichloroethene (total) 35.7%
acetone RRF 0.04065

7/31 @ 0804 MSM5972
bromomethane 43.3%
acetone 25.6%
methylene chloride -32.6%

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:

Toluene 252% / 252%
PCE 214% / 214%
chlorobenzene 176% / 172%
ethyl benzene 138% / 141%
xylene (total) 182% / 193%
1,1-dichloroethane / 138%

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: low level - okay
Mid level - 1,1-dichloroethane 136% T

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:

TCE 1.2/1.3 xylenes 0.85/0.93
PCE 0.6/0.47

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: MSShackle
Date: October 17, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII39

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 cooler temps were within control.

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
7/26/02	7/31/02	5 days	8/30/02	30 days, 16 days, 34 days,
	8/12/02*	17 days	8/16/02	17 days, 18 days, 4 days,
			9/3/02	22 days, 5 days
	"J/UJ"		8/17/02	
	"SOIL-Q-9-0.5"			

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 (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 8/16 @ 0050
bis(2-chloroethyl) ether 27.7%
hexachlorocyclopentadiene -49.4%
4,6-dinitro-2-methylphenol 21.9%
dinoseb 44.0%

8/16
CCV @ 1809
bis(2-chloroethyl) ether 21.0%
hexachlorocyclopentadiene -40.7%
2,4-dinitrophenol 24.5%
4,6-dinitro-2-methylphenol 22.2%
dinoseb 51.1% UJ

CCV 8/29 @ 0919
2,4-dinitrophenol -26.2
4,6-dinitro-2-methylphenol -23.4
dinoseb -20.6%

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.	[✓]		
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:

45366-1 50x dil.
-1DL 500x dil
-4 10x dil.
-7 10x dil.

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 analyzed @ a 50x dil. No analyte displayed recoveries.

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:

Original analyzed @ a 1x dil.
Duplicate analyzed @ a 10x dil.

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: MtShadle
Date: October 21, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 39

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 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 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
7/26/02	7/31/02	5 days	8/28/02	28 days
			8/29/02	29 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: 8/28 @ 1234
dieldrin 15.5%/
4,4'-DDD 17.1%/
methoxychlor 21.7%/
endrin ketone 17.3%/
α-BHC / -20.9%
endosulfan sulfate /15.6%

8/28 @ 2119
α-chlordane 18.5%
dieldrin 19.5% / 16.2%
endrin 20.1% / 16.7%
4,4'-DDD 36% / 29.5%
4,4'-DDT -16.4%
endrin aldehyde -26.1% / -25.1%
methoxychlor 16.3%
endrin ketone 18.7%
α-BHC / -18.9%
endosulfan I / 15.6%

endosulfan II / 15.9%
endosulfan sulfate / 17.9% no associated samples

CCV 8/29 @ 1641
α-BHC -16.8% / -25%
delta-BHC -18.9%

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?	[ ]	✓	
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: ✓ MB- TCMX 29%/
✓ LCS - DCAA /28% TCMX 26%/28%
✓ 45366-2 DCAA 29%/29% 1x
-3, -4, -1, -3 DL (all 0%) -3(10x), -4(10x), -1 (100x), -3DL (40x)
✓ 45366-5 DCAA 26%/28%, TCMX 26% 1x
45366-7 DCAA 20%/22%, TCMX 19%/22%, DBCP- 440%/340%
✓ -2DL DBCP- 184%/226% 4x

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 analyzed @ high dilution.
No analytes were recovered.

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:

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: ~~Aldrin 2.1U/4.8~~ α-chlordane 2.1U / 5.2 okay, 4,4'-DDT J 5.3/78 >100x 41.65
J(U) heptachlor epoxide 0.52/4.8 >2x RL, dieldrin J(UJ) 2.6/15 >2x RL, endrin aldehyde J(UJ) 1.4/15 >2x RL
J gamma-chlordane 1.7/24 >100% 22.3, endrin 2.4/7.8U okay 12.65

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: MSShadle
Date: October 21, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 39

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 are 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 grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
7/26/02	8/2/02	7 days	8/22/02	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:

453666B-1,
-2
-3
-4
-5
-7

all 7ICX

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:

The MS/MSD was analyzed @ a 50x dil.
~~Most~~ all %Rs were not recovered.

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:

Cl_3 BP - 29/55 = 61.9%

Cl_4 BP - 230/550 = 82.1%

Cl_7 BP - 65/110 = 59.4%

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: MSchadle
Date: October 22 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII39

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 cooler temp 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 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
7/26/02	7/31/02	5 days	8/26/02	26 days
			8/7/02	7 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: 0731N-SMB
PCP 14ug/kg 70 ug/kg

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 8/6/02 @ 2025 CCV 8/7/02 @ 0836
MCPA /15.5% dalapon 25.3% / 18.4%
MCPA 23.6% / 18.8%
MCPP / -15.8%

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:

45366B-1

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 analyzed @ 5000 x dil.
All analytes were not detected.

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: 45366B-2 45366B-7
45366B-4
45366B-5

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:

Dichloroprop	120u/1.5	okay
2,4-D	8.6/15	11.8 = 54.2%
PCP	18/36	66.7%
2,4,5-T	10u/1.3	okay
2,4-DB	28/9.9u	okay

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

SDG No.: SAII39
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: MLHandle
Date: 10/22/02

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: 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: 7/26/02 8/1, 8/2

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 - 124%, 136%
Ti - 73%, 78%, 67%, 73%
Na ~~77%~~ 69%
Pb 136%, 124%

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 0.03705 Hg- ICB -0.059
Prep Blk- Al 2.3402, Ca 2.0763, Na 41.274
As -0.6313, Cr 0.1536
Cd - -0.0523, Mg 0.6902

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: Ba - 32.1% ok
Cd - 27.8% ok
Cu 130% J+
Mg 36.4% J+

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: Al 558% / 779% (51%) >4x
Sb 67% / 69% (94%) J / UJ
Ba -411% / 512% (93%) >4x
Cd 153% / -80% (78%) >4x
Ca 361% / 595% (49%) >4x
Cr 32% / -49% (89%) >4x
Cu -562% / 41031% (-148%) >4x
Fe 34780% / 24347% (-1233%) >4x
Pb -4142% / -6184% (20%) >4x
Mg 192% / 153% (87%) >4x
Mn 355% (82%) >4x
K 126% (100%) MSD & Postspike ok
Zn -2188% / -2110% (64%) >4x
Na -719% / -1373% (90%) >4x

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:
Zn 11.7% 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: _____

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.: SAII40

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: 3.2°C - 5.9°C, only waste sample results were provided in this SDG. The Encore sample vials were received empty for sample WASTE-Q-10-8 VOC analysis was analyzed from bulk container. J, Q / UJ, Q

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
7/26/02	7/31/02	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: 7/8/02 1445 - I. Cal
7/31/02 0741) field samples, QC samples
7/31/02 2006)

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 - 1M0731MB All NDs
MB - 2M0731MB 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 (MSM5972) 7/8/02 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: C. Cal. 7/31/02 0802 bromomethane 43.3%, acetone 25.6%, methylene chloride -32.6
⊛ All RRF > 0.05 ↑ J(+) ↑ J(+).

45366C-5
-6
-7 7/31/02 2023 Bromomethane 35.5%, Methylene chloride -41.6%, 2-butanone -21.0
-8 All RRF > 0.05

MS/MSD, QC samples, N

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 - WASTE-Q-1-5' 11 MS %Rs and 12 MSD %Rs were greater than the upper control limits.
8 RPDs were greater than the acceptance limit.
See attached.
MS/MSD - WASTE-Q-9-8 Bromomethane >25%/>31%, 1,1,1-trichloroethane 135%
14 RPDs were out. 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

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

Note: LCS - 1M0731MB) All %Rs were in control.
LCS - 2M0731MB)

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:

WASTE-Q-1-5'MS	chlorobenzene-d5	147183	(147772-591688)	49.8% ↓
WASTE-Q-1-5MSD	Chlorobenzene-d5	121305	"	41.0%

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: WASTE-Q-10-8 / WASTE-Q-10-8-DUP.
chlorobenzene) difference > 2X RL J.f / UJ.f.

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:

	WASTE-Q-10-8	WASTE-Q-10-8-Dup.	Difference/RPD	RL
CS_2	0.95	4.6	3.65	12
Benzene	0.62	1.1	0.48	12
TCE	13	2.2	10.8	12
PCE	1.0	2.1	1.1	12
(*) Chlorobenzene	3.8	34	30.2	6.6/12
Ethylbenzene	0.94	1.9	0.96	12
Styrene	0.37	1.8	1.43	12
Xylene	2.8	6.0	3.2	12
(*) Acetone	66 U	280	280	66
2-butanone	33 U	38	38/m	33

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.: SAII40

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: 3.2°C – 5.9°C, only waste sample results were provided in this SDG

Case narrative was reported incorrectly - (Method 680 instead of 8270).

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
7/26/02	7/31/02	5 days	8/16, 17, 30/02	16, 17, 30 days
			9/3/02	34 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: 8/2/02 1645 I. Cal , 8/27/02 1411 I. Cal.
8/16/02 0034 45366C-3, -4RE , MS/MSD.
8/16/02 1724 45366C-2, 4
8/30/02 0935 45366C-10L
9/3/02 0834 45366C-1 , 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 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-0731A-BMB 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 (MSE 5973) 8/2/02 All %RSDs or r^2 were in control.

8/27/02 All %RSDs or r^2 were in control

6.0 Continuing Calibration

8/16/02 0147 Dinoseb 44.0% ← 45366C-3, -4RE
8/16/02 1842 Dinoseb 51.1%. ← 45366C-2, 45366C-4) UJ, c

		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 → 8/16/02 0055 bis(2-chloroethyl)ether 27.7%, Hexachlorocyclopentadiene -49.4%
45366C-3 -4RE 4,6-dinitro-2-methylphenol 21.9%, Nitrobenzene-d5 21.2%
→ 8/16/02 1809 bis(2-chloroethyl)ether 21.0%, Hexachlorocyclopentadiene -40.7%
45366C-2 -4 2,4-dinitrophenol 24.5%, 4,6-dinitro-2-methylphenol 22.2%
→ 8/30/02 0950 bis(2-chloroisopropyl)ether 22.3%, 4,6-dinitro-2-methylphenol -29.4%
45366C-10 Dinoseb -21.4%
→ 9/5/02 0850 All %Ds < 20%.
45366C-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? 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:

2-Fluorobiphenol %Rs were out in 45366C-2MSD (24%), 45366C-3 (23%), 45366C-2MS (21%), 45366C-2MSD (22%) 45366C-2MS (21%).
only one surrogate out, ok

Surrogates were diluted out in 45366C-1 (DF=10), 45366C-1DL (DF=50). 45366C-1MS (DF=10) 45366C-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:

MS/MSD - WASTE-Q-1-COMP. - Due to matrix interference, the MS and MSD were analyzed at 10X dilution. Most of the spiking compounds were dilution out.

MS/MSD - WASTE-Q-9-COMP. Hexachlorocyclopentadiene 0%/0%, 2,4-dinitrophenol 0%/0% 4,6-dinitro-2-methylphenol 0%/0%, Benzo(b)fluoranthene 0%/—
→ WASTE-Q-9-COMP-RE Hexachlorocyclopentadiene 0%/0%, 2,4-dinitrophenol 5%/0%

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 - 0731A-BMB 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:

WASTE-Q-10-COMP-Dup Chrysene 44.9% ↓ Perylene-d12 31.3% ↓

WASTE-Q-10-COMP-DUP-RE 1,4-dichlorobenzene-d4 46.5% ↓, Chrysene 41.1% ↓ Perylene-d12 29.

QC Samples

45366C-1MS Perylene-d12 41.4% ↓

45366C-1MSD 1,4-dichlorobenzene-d4 24.7% ↓, Perylene-d12 32.7% ↓

45366C-2MSD Perylene-d12 40.2%.

45366C-2MS Naphthalene-d8 217.0% ↑, Acenaphthene-d10 275.6% ↑, Phenanthrene-d10 298.8%

45366C-2MSDRE Acenaphthene-d10 242.5% ↑, Phenanthrene-d10 288.1% ↑.

45366C-2MSRE Phenanthrene-d10 209.6% ↑.

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: Most of positive detections had RPDs > 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: WASTE-Q-10 COMP / WASTE-Q-10-COMP-Dup.

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: 4

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 8

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

% Completeness = 96.9%

Note: 252/260

	WASTE-Q-10-COMP	WASTE-Q-10-COMP-DUP.
Dimethylphthalate	460U	26J ✓
phenanthrene	320	280 ✓
Anthracene	66	66 ✓
Fluoranthene	320	350 ✓
pyrene	670	770 ✓
Butylbenzylphthalate	80	82 ✓
Benzo(a) anthracene	190	210 ✓
Chrysene	200	290 ✓
Bis (2-ethylhexyl) phthalate	160	220 ✓
Benzo(k) fluoranthene	300	440 ✓
Benzo(a) pyrene	200J	420U

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.: SAII40

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: 3.2°C - 5.8°C, only waste sample results were 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
7/26/02	8/2/02	7days	8/22/02	20days

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: 8/18/02 0829 (MSK5972) I. Cal.
8/22/02 0441 45366C-1, 45366C-2
8/22/02 1641 45366C-3, 45366C-4, 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 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 - 0802A-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.

8/18/02 (MSK5972 All % RSDs 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% 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:

8/22/02 0545
1841
8/22/02 1753.
8/23/02 0010.

All %Ds <30% (for waste samples, OK)
All 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: WASTE-Q-1-COMP and MS/MSD DF=500.
WASTE-Q-9-COMP and MS/MSD DF=100. All surrogates were diluted out
(WASTE-Q-10-COMP DF=10
WASTE-Q-10-COMP-DUP 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: MS/MSD - WASTE-Q-1-COMP, WASTE-Q-9-COMP.
↳DF=500 ↳DF=100.
Due to the levels of dilutions required, spiking compounds were not recovered.

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 - 0802A-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).

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: 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:

	WASTE-Q-10-COMP	WASTE-Q-10-COMP-DUP.	Difference	RL
Tri -	22	10	12 / N	46 x 2 = 9
Tetra -	200	36	164 / N	85 x 2 = 17
Penta -	210	75	135 / N	85 x 2 = 17
Hexa -	66	85 U.	66 / N	85

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.: SAII40

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: 3.2°C – 5.9°C, only waste sample results provided in this SDG.

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
7/26/02	7/31/02	5 days	8/8/02	8 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-07310-JMB 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. 8/5/02 (SGJECD) 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: 8/5/02 1019.) All %Bs were in control
8/7/02 1820)

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: 8/7/02 1857 RTX-CLP ~~Endosulfan II -15.4%~~ ≈ 15%, ok
RTX-CLPII Endosulfan II -15.7%. — J(+)

8/8/02 0533. RTX-CLP All %Ds < 15% (TA) ≈ 10 ok — All NDs ok
RTX-CLP2 ~~Methoxychlor -15.4%~~ ≈ 15 Endrin Ketone -20.9%, TCMX -16.7%, DCBP -19.5%.

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

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

Note: Surrogates were diluted out in samples WASTE-Q-1-COMP (DF=50), WASTE-Q-9-COMP (DF=50) and their associated MS/MSD. (DF=50). 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: MS/MSD - WASTE-Q-1-COMP and WASTE-Q-9-COMP.
Due to the abundance of target compounds in the parent samples, the MS and MSD were analyzed at 50x dilution. Due to the level of dilution required, spiking compounds were not recovered, therefore, deliverable Form III's have not been 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 - 07310-JMB 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 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: WASTE-Q-10-COMP / WASTE-Q-10-COMP-DUP.

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: 4

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:

	WASTE-Q-10-COMP	WASTE-Q-10-COMP-DUP.	Difference/RPD		RL
gamma-BHC	0.69	0.75 ✓		8%	
beta-BHC	2.4U	0.21 ✓	0.21		2.4
Heptachlor epoxide	3.3	2.6 ✓		24%	
gamma-chlordane	8.8	8.4 ✓		5%	
alpha-chlordane	9.7	8.6 ✓		12%	
Endosulfan I	1.1	2.2U.	1.1		2.2
44'-DDE	6.7	6.7 ✓		0%	
Dieldrin	8.5	7.6 ✓		11%	
44'-DDD	12	10 ✓		18%	
Endosulfan II	3.3	4.2U ✓	3.3		4.2
44'-DDT	10	6.9 ✓		37%	
Endrin aldehyde	6.5	5.7 ✓		13%	
Methoxychlor	24U	5.4 ✓	5.4		24

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.: SAII40

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: 3.2°C - 5.8°C, only waste sample results were reported in this SDG

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
7/26/02	8/6/02	11 days	8/10/02	4 days
			9/4/02	29 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 - 0806N-SMB Pentachlorophenol (PCP) at 4.4 ug/kg.

→ 22 ug/kg. (x5) 45366C-2 -4

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. 7/22/02 (SGSECD) All %RSDs were in control.

8/30/02 (SGSECD) 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:
8/9/02 2244 All %Ds <15%.
8/10/02 1046 DB-XLB 2,4-DB 20.6%. DB-35MS All %Ds <15%.
9/3/02 1917 DB-XLB All %Ds <15%, DB-35MS ~~MCPP 15.4%~~ ≈15% OK.
9/4/02 0727 All %Ds <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: WASTE-Q-1-Comp. MS, MSD – DF=5000, all surrogates were diluted out. ok

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 - WASTE-Q-1-COMP. DF=5000, All spiking compounds were diluted out, ok
MS/MSD - WASTE-Q-9-COMP MCPP RPD=74%, 24-D RPD=62%, PCP 67%.

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- 0806N-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:

Several positive detections → RPD > 40%, 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	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:

	WASTE-Q-10-COMP	WASTE-Q-10-COMP-DUP.	Difference/RPD	RL	
MCPP	1300	1000	26%		
2,4-D	33	3.8	39.2 ug/kg	12	J.f/UJ.f
PCP	170	6.4	163.6 ug/kg		J.f

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.: SAD40
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.: 3.2°C - 5.8°C, only waste sample results were reported in this SDG.

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	7/26/02	8/9/02	14 days
Hg	7/26/02	8/14/02	19 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%

r = 0.999679 /

Note: CRM
Al initial 124%, final 136%
Na final 69%.
Tl initial 73%, final 78%
As initial 127%
Pb initial 136%, final 124%.
Tl initial 76%, final 79%
Tl initial 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: 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: WASTE-Q-10-COMP Se J.n
WASTE-Q-10-COMP-DUP Se Jn see attached.
V J.n

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 — use MS/MSD

		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 - WASTE-Q-1-COMP ~~Al RPD=26.5%~~ ~~Ba RPD=29.6%~~, ~~Cu RPD=26.3%~~ (JA) OK use 35%
Hg RPD=115.9% (JA)
MS/MSD - WASTE-Q-9-COMP (JA) ~~Cd RPD=24.41%~~ Cu RPD=45.99%, Fe = 45.21 %
Mn RPD= 35.89%, ~~Ni RPD=21.49%~~ (JA)

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 - WASTE-Q-1-COMP Sb 66%/59%, Cd 52%/46%, K 61%/39%.
MS/MSD - WASTE-Q-9-COMP Sb 43%/44%. Ni MS=46%, K MS=47%.
Ag MS=61%.

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: 1ep Serial dilution WASTE-Q-1-COMP, WASTE-Q-10-COMP.
Hg Serial dilution WASTE-Q-1-COMP, WASTE-Q-9-COMP

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: WASTE-Q-10-COMP / WASTE-Q-10-COMP-DUP.

Ni RPD= 181.0%. J, f

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: RA
Date: 10/18/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No. 5HL41

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, 4.9, 5, 5.1, 4.7

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
7/30/02	8/10/02	11
"	8/11/02	12

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-0730-KC carbon disulfide 0.31 ug/L 25x → 0.4 at RL
styrene 2.4 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 8/1/02 bromomethane r 0.987 del 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 8/9/02 Chloromethane -27.2, bromomethane -26.3
→ POS → J/C → prev. flagged for IC-

CC 8/11/02 chloromethane -21.4 POS. → 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?	[✓]		
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 150 > 40-141
MSD, LCS 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:

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 "E" in several samples → J19
use DL 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-7-104	RL	-104D
Chloromethane	0.5	1
benzene	0.35	
Chlorobenzene	8.8	
toluene	1U	1

1U ✓ OK		
0.31 OK		
8.6 2% RPD OK		
0.35 OK		

GW-AA-Q-1-127 1/2		2-D
Chloromethane	5U	OK
VC	4.6	4.5 OK
benzene	33	33 0% RPD
Toluene	1.5	5U OK
Chlorobenzene	1300	1300 0% RPD
Ethylbenzene	6.9	6.55% RPD

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: 10/18/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No. SAII41

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, 4.9, 5, 5.1

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
7/30/02	8/5/02	6	9/5/02	30
"	"	"	8/30/02	25
"	"	"	9/3/02	28
"	"	"	9/4/02	29

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

no pos, 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: surr. diluted out in several DF 7/10 no action ✓

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 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:

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: ~~[illegible]~~ several compds → E
Jrg
used 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-9-1-127 1/2		-1/2 D		GW-AA-Q-7-104 RL-104D		
				all ND		
1,4-DCB	19	19	0% RPD	indeno-1,2,3	10	967 OK
1,2-DCB	440	430	2% "	dibenz(a,h)	10	163 OK
4-Chloroaniline	2600	3500	24% RPD			

GW-AA-Q-7-104 filtered — all ND

104 D- filtered — all ND

GW-AA-Q-1-127 1/2 -Filtered — DUP

phenol	2	10U	OKV
2-chlorophenol	5.6	5.6	0% RPD
1,3-DCB	2.5	2	OKV
1,4-DCB	22	16	31% RPD
1,2-DCB	680	590	14% RPD
2,4-DCphenol	12	12	0% RPD
1,2,4-TCB	6.1	4.6	28% 4
naphthalene	3.1	3	OKV
4-Chloroaniline	2300	2400	4% RPD
3 & 4 methyl phenol	10U	2.2	OKV

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: 10/18/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: 5AII41

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: 4.5/4.7/5.2

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
7/30/02	8/1/02	2	8/10/02	9

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
pos. alpha-BHC JC in GW-AA-Q-1-127 1/2-D
ND for others, 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

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

Note: decachlorobiphenyl < QC on both columns for all samples
tetrachloro-m-xylene < QC one column sample GW-AA-Q-1-127 1/2
UJ's all 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: LCS/LCSD 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

		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% all prev. flagged SUV - 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: GW-AA-Q-7-104 all ND; 104-D all ND; -127 1/2 / 127 1/2 D

alpha-BHC	.056	.056
dieldrin	.076	.1U
heptachlorepoxide	.05U	.45
Endrin	.1U	.055
Endosulfan sulfate	.1U	.051

OK ✓

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 ; QC 150% at 156% for GW-AA-Q-1-127 1/2
155% " " " DUP
all prev. flagged

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.: SAII4

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:

4.9, 5, 5.1, 5.2

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
7/30/02	8/1/02	2	8/23/02	22
"	"	"	8/24/02	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 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

		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: GW-AA-Q-7-104 RL -104DUP GW-AA-Q-1-127 1/2 DUP
all ND all ND all ND
nonachlorobiphenyl 0.5 0.04 ow

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: 10/18/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 41

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, 4.7, 5, 5.1

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(-).		[✓]	

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
7/30/02	8/1/02	2	8/6/02	5

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 → pentachlorophenol .24 ug/L all ND, no flags

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
NDs → UJ/C for pentachlorophenol, 2,4,5-TP, 2,4,5-T, 2,4-DB

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 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: GW-AA-Q-7-104 ND | -104DUP ND | GW-AA-Q-1-127 1/2 214-D 2.2 | DUP 2.6 16% RPD ✓

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.: ~~HT~~ SA II 41
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:

collected	analyzed	
7/30/02	8/10, 14/15/02	ICP
"	8/13/02	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: CRDL
initial and final iron 79%, 79%, Se 123, 129%, thallium 124, 77
final lead 124, 126%, ~~final Se 132~~
initial iron 126

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 pos al <5 x U/P at RL

ICB/CCB pos al, ba, cu, mg, mn, V low levels

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.)		✓					✓					
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 7QC all 184 / 156
MS 7QC Potassium 127 ~~no flags were applied since sample was from another SDG (SAM 37)~~
Sodium 129
pos 3IM

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 Yes	ICP No	ICP NA	GFAA Yes	GFAA No	GFAA NA	CVAA-Hg Yes	CVAA-Hg No	CVAA-Hg NA	Cyanide Yes	Cyanide No	Cyanide 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:

GW-AA-Q-7-104fil / 104DUP-fil

As	.0077	.0052 ✓	
Ba	.66	.62 ✓	
Ca	150	140	11% RPD ✓
Fe	26	25	4% RPD
Mg	35	33	5% RPD
K	11	10	9% "
Na	16	15	9% RPD ✓

GW-AA-Q-1-127F -FDUP

Ba	.26	0.26	0% RPD
Ca	260	260	"
Fe	13	13	"
Mg	70	71	1% RPD
K	26	26	0
Na	64	65	1 ✓
Zn	.023	.022	OK ✓

12.0 Data Completeness

		ICP Yes	ICP No	ICP NA	GFAA Yes	GFAA No	GFAA NA	CVAA-Hg Yes	CVAA-Hg No	CVAA-Hg NA	Cyanide Yes	Cyanide No	Cyanide 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:

GW-AA-Q-7-104 -104DUP

Al	0.18	Rb 0.2	0.35 ✓	
As	.012	0.01	0.0073 ✓	
Ba	.64	0.01	0.62 ✓	3% RPD ✓
Ca	150		140	7% RPD
Cr	.0081	0.01	.0075 ✓	
Cu	.0037	0.02	0.0024 ✓	
Fe	25		25	0% RPD
Mg	34		33	3% "
Mn	1.3		1.2	8% "
Ni	.0048	0.04	0.0059	OK ✓
K	10		10	0%
Na	15		15	0%
V	.0012	0.01	0.0016	✓

GW-AA-Q-1-127 1/2 , -DUP

Al	21	23	9% RPD
As	.031	.041 ✓	
Ba	.62	.66 ✓	
Be	.0022	.0024 ✓	
Cd	0.0012	.0014 ✓	
Ca	310	310	0%
Cr	0.17	.18 ✓	
Co	0.021	.025 ✓	
Cu	.069	.078 ✓	
Fe	81	91	11%
Pb	.045	.053 ✓	
Mg	78	78	0%
Mn	3.4	3.9	13%
Ni	.071	.079 ✓	

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: RA
Date: 10/18/02
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.: SAII 41
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, 4.9, 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
7/30/02	8/8/02	9

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 4/12/02 FID r 0.987 DDS → J/r ; CC 8/7/02 FID %D 20.6715%, prev. flagged ✓
CC 8/7/02 TCD %D 8/10 at 19.9% → 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/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 → 60/74 < 75-125
acc prev. flagged

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:

	GW-AA-Q-7-104	-DUP	RPD	GW-AA-Q-7-127	-DUP	% RPD
methane	480	520	8% ✓	89	110	21 ✓

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 several "E" det prev. flagged due to calib-
use result from TCD detector for methane

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: 10/18/02
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.: SATH1
Test Name: Various
Method No.: 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: 4.5, 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	
7/30/02	7/31/02	1	NO3/NO2
"	8/2/02	2	SO4
"	8/19/02	9	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:

GW-AA-Q-7-104		-DUP	
CO2	23	15	42% RPD
Alk	500	540	7%
NO3	0.05U	0.014	OKU

GW-AA-Q-1-127		DUP	RPD
CO2	24	20	18% ✓
Alk	760	740	3%
SO4	190	190	0% ✓
NO3	0.05U	0.013	OKU

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: Mlkhadle
Date: Oct 25, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII42

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: 5.4°C, 5.5°C, 5.2°C, 5.1°C, 5.0°C, 5.3°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
7/31/02	8/6/02	6 days
	8/7/02	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:

100806MB			100807MB		
MeCl2 -	1.3 ug/L	~~5~~ 13			
carbon tetrachloride	0.11 ug/L	0.55	MeCl2 -	1.4 ug/L	14
ethyl benzene	0.20 ug/L	1.0	ethylbenzene	0.11 ug/L	0.55
styrene	0.18 ug/L	0.9	xylene (total)	0.31 ug/L	1.55
xylene (total)	0.64 ug/L	3.2			

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 >0.990)	[✓]		
	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
acetone 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:

8/6/02
acetone 0.04013 RRF
1,1-dichloroethane 38.4%
PCE 24.7%

8/7/02
acetone 0.04357 RRF
bromomethane 26.5%
chloroethane 22.2%
1,1-dichloroethane 48.5%
PCE 28.5%
1,2-dichloroethene (total) 34.7%

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.) 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:

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:

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: 9

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: 9

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

% Completeness = 96.97%

Note:

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

Reviewer: Mustchadle
Date: October 05, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 42

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
7/31/02	8/5/02	5 days	8/26/02	21 days
			9/4/02	30 days
			8/30/02	25 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^2 >0.995? (r = 0.990)			
	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:
4-nitrophenol r^2 0.9895 J^+/UJ^-
pentachlorophenol 0.9878 J^+/UJ^-
Butyl benzyl phthalate 0.989 J^+/UJ^-
bis(2-ethylhexyl) phthalate 0.9877 J^+/UJ^-

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 @ 8/22 1158
butylbenzylphthalate 29.2% - previously flagged

CCV @ 8/30 0817
2,6-dinitrotoluene 83.5%
2,4-dinitrophenol 24.0%
2,4-dinitrotoluene 31.1%

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? 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 > 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: _____

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: Mitchell
Date: Oct 28, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII42

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 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 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
7/31/02	8/5/02	5 days	8/10/02	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:

8/10 @ 0811		8/10 @ 1748		8/21 @ 1314	
4,4'-DDT	16.0%	2,4-DCAA	-19.6%	2,4-DCAA	-17.7%
2,4-DCAA	-20.6% / -17.3% ? surrogate	TCMX	-21.5% / -20.2% - surrogate	4,4'-DDT	/ -21.3%
TCMX	-21.0% / -23.6%	α-BHC	/ -30.4%	methoxychlor	/ -18.9%
α-BHC	/ -32.8%	delta-BHC	/ -26.1%		
delta-BHC	/ -29.4%	4,4'-DDE	/ -27.3%	8/21 @ 2135	
4,4'-DDE	/ -29.9%	4,4'-DDT	/ -16.4%	2,4-DCAA	-17.6%
DCBP	/ -20.2% - surrogate	DCBP	/ -17.2% - surrogate		

not surr. but other ok

criteria met other column ok

no samples associated than.

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:

45452-1	DCB	14% / 15%	J/UJ
-2	"	15% / 10%	↓
-3	"	/ 24%	
-8	"	14% / 12%	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

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

Note: α-BHC 40%/44% ↓ J/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: 45452-1 endosulfan I 52.6% 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: 4

14.1.2 Number of target compounds in each analysis: 21

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 = 80/84 = 95.2%

Note:

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

Reviewer: Mikhadle
Date: October 28, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 42

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 cooler temps met criteria.

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
7/31/02	8/7/02	7 days	8/26/02	19 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: MSthadle
Date: October 25, 2002
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII42

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

		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
7/31/02	8/7/02	7 days	8/12/02	5 days
	8/28/02	28 days*	9/10/02	9 days

→ GW-AA-Q-2-120 + GW-AA-Q-8.64 → 2x hold time J/R

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: 0807N-SMB dichloroprop 0.14 0.7 2,4,5-TP 0.12 0.6
dicamba 0.13 0.65 2,4-D 2.1 10.5 2,4,5-T 0.21 1.05
MCPP 37 185 PCP 1.6 8

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 8/12@ 1518
MCPP 18.4%, MCPA /20.5%
dichloroprop 18.5%, 2,4-D /19.1%
PCP 15.9%, 2,4-DB /23.4%
~~dinoseb 19.9% /22.1%~~ - not

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: 8/7 - PCP - 290%/ (102%) - all results non-detect.

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: 45452-8 GW-AA-Q-2-60 122.7%

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	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:

		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 (6 w/ re-extracted)

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 10 + 9 = 19

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

% Completeness = 100% for 4 samples / 68.3% if re-extracts are included.

Note:

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

SDG No.: SAII 42
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: Mitchadle
Date: October 28, 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 are 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: 7/31/02

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
Fe - 79%, 79%
Se - 123%, 129%
Pb - 124%

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 0.03242 Prep Blk - Al ~~0.02721~~ 0.02256
Mg 0.00687 Ca 0.03087
Mg 0.00934

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 149% (34%) 74x Spike amt. No action taken.
Fe 173% (28%)

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: Mitchelle
Date: October 28 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: 21560888.06005
Laboratory: SR- Savannah
SDG No.: SATI42
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 were 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:
7/31/02 8/9/02 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 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 - $r^2 = 0.987$ 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/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%/74% ↓

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:

5.4/16 =

10.6 /10.7 = 99.1% J+

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: Mitchell
Date: Oct 28, 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.: SAII42
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 cooler temps were 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:

	Date Collected	Date Analyzed	HT
NO_3^-	7/31/02	8/2/02	2 days
Alk	"	8/14/02	14 days
SO_4^{-2}	"	8/7/02	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:

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: 10/29/02
Lab: STL

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII43

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: 5.3, 5.6

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
8/1/02	8/11/02	10
"	8/10/02	9
8/2/02	8/10/11/02	8/9

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-080102-KH chloromethane 0.63 ug/L, ethylbenzene 0.88 ug/L
Pos <5x → ug at RL

TB-0802-KH MCl3 0.77, benzene .15 ug/L no pos. no flags

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 0.987 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 8/9/02 chloromethane -27, bromomethane -26.3 pos. → J,C unless prev.
CC 8/11/02 chloromethane -21.4 pos. 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?	[✓]		
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 bromomethane 150% > 40-141
MSD, 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 > 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: 10/30/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No. ~~SA~~ II 43

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: 5.3, 5.6

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
8/1/02	8/4/02	3	8/30/02	26
"	8/5/02	4	"	25
8/2/02	8/6/02	4	"	24
"	"	"	9/1/02	26

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: IC 8110102 2,6-dinitrotoluene .987, 3-nitroaniline 0.988, 4-nitroaniline 0.984 ~~[illegible]~~ in the ab. sample UJ,R GW-AA-Q-8-111

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

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 Provided - 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:

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	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: 10/29/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAT43

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: 5.3, 5.6

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
8/1/02	8/5/02	4	8/10/02	5
8/2/02	4	3	4	5

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

4,4-DDT NDs → UJ,C in all

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 LQC 30-150 one column in GW-AA-Q-2-130B(26) GW-AA-Q-8-111(26) } no action

two columns in GW-AA-Q-8-104(26,24) GW-AA-Q-3-50(26,15) } UJ's unless J's prev.

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

		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 compd >40% in GW-AA-9-3-50
all 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
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 10/29/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI43

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: 5.3, 5.6

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

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

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
8/1/02	8/7/02	6	8/26/02	19
8/2/02	4	5	8/24/02	4

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 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

		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).

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: 10/28/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No. 5877-43

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: 4.9, 5, 5.2, 5.9

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
8/1/02	8/7/02	6	8/12/02	5
8/1/02	8/28/02	27	9/6/02	9, GW-AA-Q-2-130 B RE → R, J
8/2/02	8/7/02	5	8/12/02	5
8/2/02	9/13/02	42	9/18/02	5 GW-AA-Q-8-104 RE → R, J
8/2/02	8/28/02	26	9/6/02	9 GW-AA-Q-3-50 RE → R, J

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 8/7/02 Pos for dicamba, MCPP, dichloroprop, 2,4-D, pentachlorophenol, 2,4,5-TP, 2,4,5-T Pos 5 5x, U,Z or U,Z at RL
MB 9/13/02 2,4-D .33 ug/L No pos, no action ✓

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 - either no pos. results or NDs were previously flagged -

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. See below

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: pentachlorophenol LCS 290% > 11-110 Pos. Prev. Flagged
& RPD 102 > 34 for blank cont.
no more ✓

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: Some compd 740% in GW-AA-Q-3-50. all prev. passed.

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: Since re-extracted results not used, did not use them in this calculation-

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

SDG No. 3
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RH
Date: 10/28/02

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
~~8/1,2/02~~ 8/9,15/16/02 ICP
" 8/14/02 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: CRDL Initial, Final → iron (79/79), Se (123/129)
final As (75), Tl (73)

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 → al, ca, Mg, pos. al <5x → U, P at RL ca, Mg >5x, no action

ICB, CCB, pos, al, ba, ca, copper, Mg, mn, V at low levels. 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%) / 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:

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: