3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		✓*
3.7	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:

CCV @ 7/2/02 @ 2349 — no associated samples
2,3,4,7,8-PeCDF @ -18.9%
CCV @ 7/3/02 @ 04:41
13C-1,2,3,4,6,7,8-HpCDF 21.8%
13C-1,2,3,4,6,7,8-HpCDD 29.1%
13C-OCDD 30.1%
no associated samples

CCV @ 7/3/02 @ 06:44
13C-1,2,3,4,6,7,8-HpCDF -19.9% - surrogate, no action taken
OCDF -15.5% ~~[illegible]~~
CCV @ 7/3/02 @ 16:39
1,2,3,7,8,9-HxCDD -17.3% ~~[illegible]~~
OCDF -28.3% ~~[illegible]~~
increase in instrument sensitivity no action necessary

* The laboratory did not include information regarding the S/N ratio.

TA

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: 1,2,3,7,8,9-HxCDD - 137% ↑ /
2,3,4,6,7,8-HxCDF - 138%/138% ↑
1,2,3,7,8,9-HxCDF - 153%/143% ↑

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.			✓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard and Surrogate Recovery

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

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MSShadle
Date: 7/19/02
DV Level: II (III) IV
Review Document:

___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 23-20010024.02
Laboratory: STL-West Sacramento
SDG No.: G2F190283
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 6/18/02
Date Prepped - 6/30/02 12 days
Date Analyzed - 7/3/02 3 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		*✓
3.7	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: CCV 7/2/02 @ 2349
2,3,4,7,8-PeCDF -18.9%
CCV 7/3 @ 0441
13C-1,2,3,4,6,7,8-HpCDF 21.8%
13C-1,2,3,4,6,7,8-HpCDD 29.1%
13C-OCDD 30.1%
CCV 7/3 @ 0655
13C-1,2,3,4,6,7,8-HpCDF -19.9%
OCDF -15.5%
CCV 7/3 @ 1639
1,2,3,7,8,9-HxCDD -17.3%
OCDF -28.3%
* The laboratory did not include information regarding S/N ratios.

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSD 1,2,3,7,8,9-HxCDD 137%/↑
2,3,4,6,7,8-HxCDF 138%/138%↑
1,2,3,7,8,9-HxCDF 153%/143%

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.			✓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MiSshadle
Date: 7/19/2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 23-20010024.02
Laboratory: STL-West Sacramento
SDG No.: G2F200329
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 6/19/02
Date Prepped - 6/30/02 11 days
Date Analyzed - 7/3/02 3 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		✓*
3.7	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: CCV 7/2 @ 2349

2,3,4,7,8-PeCDF -18.9%

CCV 7/3 @ 04:41

13C-1,2,3,4,6,7,8-HpCDF 21.8%

13C-1,2,3,4,6,7,8-HpCDD 29.1%

13C-OCDD 30.1%

no affected analytes

CCV 7/3 @ 0655

13C-1,2,3,4,6,7,8-HpCDF -19.9%

OCDF -15.5%

CCV 7/3 @ 1639

1,2,3,7,8,9-HxCDD -17.3%

OCDF -28.3%

increase in instrument sensitivity

no action taken.

* The laboratory did not ~~provide~~ provide information regarding the S/N ratio.

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSD - 1,2,3,7,8,9- HxCDD 137% / ↑
- 2,3,4,6,7,8- HxCDF 138% / 138% ↑
1,2,3,7,8,9- HxCDF 153% / 143% ↑

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.			✓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchell
Date: 7/22/02
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 23-20010024.02
Laboratory: STL-West Sacramento
SDG No.: G2F210326
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C ~~Label on~~ COC says GW-UAA-2-60FT
Label on bottle says GW-UAA-2-70Ft. - use label on bottle

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:
Date Sampled - 6/20/02
Date Prepped - 6/30/02 10 days
Date Analyzed - 7/3/02 3 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓ (*)		✓
3.7	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:

CCV 7/2 @ 2349
2,3,4,7,8-PeCDF -18.9%
CCV 7/3 @ 04:41
13C-1,2,3,4,6,7,8- 21.8%
13C-1,2,3,4,6,7,8- 24.1%
13C-OCDD 30.1%

CCV 7/3 @ 0655
13C-1,2,3,4,6,7,8-HpCDF -19.9%
OCDF -15.5%
CCV 7/3 @ 1639
1,2,3,6,7,8-HxCDD -17.3%
OCDF -28.3%

* The laboratory did not provide information regarding the S/N ratio.

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSDup 1,2,3,7,8,9-HxCDD 137%/↑
2,3,4,6,7,8-HxCDF 138%/138% ↑
1,2,3,7,8,9-HxCDF 153%/143% ↑

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.			✓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: M Shelle
Date: 7/22/02
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 23-20010034.02
Laboratory: STL-West Sacramento
SDG No.: G2F260243
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

Date Sampled - 6/24/02
Date Prepped - 6/30/02 6 days
Date Analyzed - 7/3/02 3 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		✓*
3.7	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:

CCV 7/2 @ 2349
2,3,4,7,8-PeCDF -18.9%
CCV 7/3 @ 0441
13C-1,2,3,4,6,7,8-HpCDF 21.8%
13C-1,2,3,4,6,7,8 HpCDF 29.1%
13C-OCDD 30.1%
} no associated samples

CCV 7/3 @ 0655
13C-1,2,3,4,6,7,8-HpCDF -19.9%
OCDF -15.5%
CCV 7/3 @ 1639
1,2,3,7,8,9-HxCDD -17.3%
OCDF -28.3%
} all associated sample results ND.

* The laboratory did not include information regarding the S/N ratio.

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSDup 1,2,3,7,8,9- HxCDD 137% / ↑
2,3,4,6,7,8- HxCDF 138% / 138% ↑
1,2,3,7,8,9- HxCDF 153% / 143% ↑

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.			✓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MSShadle
Date: 7/19/02
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 23-20010024.02
Laboratory: STL-West Sacramento
SDG No.: GZF270270
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 6/26/02
Date Prepped - 6/30/02 4 days
Date Analyzed - 7/3/02 3 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✗ (✓)		✓*
3.7	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:

CCV 7/2 @ 2349
2,3,4,7,8-PeCDF -18.9%
CCV 7/3 @ 04:41
13C-1,2,3,4,6,7,8-HpCDF 21.8%
13C-1,2,3,4,6,7,8-HpCDD 29.1%
13C-OCDD 30.1%

CCV 7/3 @ 0055
13C-1,2,3,4,6,7,8-HpCDF -19.9%
OCDF -15.5%
CCV 7/3 @ 1639
1,2,3,7,8,9-HxCDD -17.3%
OCDF -28.3%

all associated sample results are ND No data qualifying action

* The laboratory did not include information regarding the S/N ratio.

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSD 1,2,3,7,8,9 - HxCDD 137% / ↑
2,3,4,6,7,8 - HxCDF 138% / 138% ↑
1,2,3,7,8,9 - HxCDF 153% / 143% ↑

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.			✓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

G2F290184, G2G030282, G2G100238, G2G110175
G2G110183,

Reviewer: Mitchell
Date: August 13, 2002
DV Level: II (III) IV
Review Document:

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

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-West Sacramento
SDG No.:
Test Name: Dioxins/Furans
Method No.: 8280 / 8290

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°C, 3°C, 6°C, 5°C, 4°C,

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 6/28/02, 7/2/02, 7/9/02, 7/10/02, 7/15/02
Date Prepped - 7/22/02 — 24 days, 20 days, 13 days, 12 days, 7 days
Date Analyzed - 8/2/02, 8/6/02 — 11 days, 15 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓	✓	✓
3.7	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:

CCV - 8/1/02 @ 08:02
1,2,3,4,7,8-HxCDD -17.9%
13C-OCDD -15.3%
CCV - 8/2/02 @ 1851
13C-1,2,3,4,7,8-HxCDF - -16.8% 13C-OCDD -18.8%
1,2,3,4,7,8-HxCDD -20.1%
13C-1,2,3,4,6,7,8-HpCDF -15.9%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.	✓		
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard and Surrogate Recovery

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

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchell
Date: October 1, 2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number: G2G020272
Laboratory: STL-West Sacramento
SDG No.: 21560888.06003
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 - 6°C

* Samples -1, -3, -9 have identification issues to be addressed in DV report

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.	✓		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: Waste

Date Sampled - 7/1/02 7/1/02
Date Prepped - 8/1/02 31 days* 8/2/02 32 days*
Date Analyzed - 8/15/02 14 days 8/15/02 13 days
8/7/02 6 days
~~8/15/02~~

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.			
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).			
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).			
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			
3.7	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: Waste CCV @ 8/7 @ 1104 (8/14)
^{13}C-OCDD -16.9%
CCV 8/12 @ 1051
^{13}C-OCDD -22.3%
CCV 8/23 @ 0643
^{13}C-OCDD -18.3%
CCV 8/25 @ 1027
^{13}C-OCDD -23.9%

CCV 8/15 1036
^{13}C-OCDD -16.0%
1,2,3,6,7,8-HxCDD 16.8%
Total HxCDD 16.8%
CCV 8/16 @ 1035
^{13}C-OCDD -20.3%

TCLP
CCV 8/15 @ 0805
^{13}C-OCDD -24.6%
1,2,3,6,7,8-HxCDF 16.5%
CCV 8/16 @ 2119
^{13}C-OCDD -23.6%
CCV 8/23 @ 0643
^{13}C-OCDD -18.3%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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: Waste
ND

TCLP
none

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

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: Waste TCLP- 1,2,3,7,8- PeCDD 156%/ OCDD 0%/0%
no MS/MSD 1,2,3,6,7,8- HxCDD 157%/ 2,3,4,6,7,8- HxCDF 169%/
1,2,3,4,6,7,8- HpCDD /30% 1,2,3,4,7,8,9- HxCDF 168%/ (53%)
OCDF /151%

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: Waste TCLP
okay okay

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: SIL-0-3-6FT 1,2,3,4,6,7,8- HpCDF 0.96 / 0.18
1,2,3,4,6,7,8- HpCDD 6.4 / 1.2 total HpCDF 4.9 / 0.83
Total HpCDD 15 / 2.6 OCDF 6.9 / 0.78
OCDD 78 / 14

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?			
8.2	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.			
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?			
8.4	Were there any transcription /calculation errors?			

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)			
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes:

Waste-O-2-7FT (TCLP)
^{13}C-2,3,7,8-TCDD 128% ↑
^{13}C-2,3,7,8-TCDF 128% ↑

Waste-S-2-6FT (TCLP)
^{13}C-2,3,7,8-TCDD 132% ↑
^{13}C-2,3,7,8-TCDF 130% ↑
^{13}C-1,2,3,4,6,7,8-HpCDF 126% ↑
^{13}C-1,2,3,6,7,8-HxCDD 126% ↑

Waste-O-3-9FT (TCLP)
^{13}C-2,3,7,8-TCDD 126% ↑
^{13}C-2,3,7,8-TCDF 126% ↑
^{13}C-1,2,3,6,7,8-HxCDD 122% ↑

Waste-S-1-6FT
^{13}C-TCDD 123%
^{13}C-TCDF 125%
^{13}C-1,2,3,4,6,7,8-HpCDF 123%
^{13}C-1,2,3,6,7,8-HxCDD 124%

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: M. Wheadle
Date: November 1, 2002
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06005
Laboratory: STL-West Sacramento
SDG No.: G2G030314
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 Temps - 4°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.	✓		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .	✓		

Notes:

	Waste			TCLP	
Date Sampled -	7/2/02			7/2/02	
Date Prepped -	9/10/02	70 days*	J+/R-	8/2/02	31 days
Date Analyzed -	9/24/02	14 days		8/15/02	13 days

*see case narrative

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: CCV (TCLP)
8/15/02 @ 0805
^{13}C-OCDD -24.6%
1,2,3,6,7,8-HxCDF 16.5% UJ,e
8/16/02 @ 2119
^{13}C-OCDD -23.6% } no associated sample

CCV 8/23 @ 0643
^{13}C-OCDD -18.3% } no associated sample

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: 2,3,7,8-TCDD /316% (117%) J,J 1,2,3,7,8,9-HxCDD 32%/(65%), 2,3,7,8-TCDF 240%/136%, 1,2,3,6,7,8-HxCDF 165%/62% LCS ok
1,2,3,7,8-PeCDD /204% (109%) J,J 1,2,3,4,6,7,8-HpCDD 0%/29700%, 1,2,3,7,8-PeCDF 80%/71%, 2,3,4,6,7,8-HxCDF 155%/
1,2,3,6,7,8-HxCDD 74x 2.5%/310%, OCDD 0%/0% 4x, 1,2,3,4,7,8-HxCDF 74x 423%/0%, 1,2,3,4,6,7,8-HpCDF 1370%/0% 74x

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

OCDD 146% ↑

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?		✓	
8.2	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.		✓	
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)		✓	
9.1.1	Nunber of samples: 3			
9.1.2	Number of target compounds in each analysis: 25			
9.1.3	Number of results rejected and not reported: 11			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness = 64/75 = 95.3%			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: WASTE

WASTE-0-1-4FT
^{13}C-2,3,7,8-TCDF 24%
^{13}C-1,2,3,4,6,7,8-HpCDF 24%

SOIL-0-1-6FT
^{13}C-OCDD 25%

MS/MSD
^{13}C-2,3,7,8-TCDD /24%
^{13}C-OCDD /155%

TCLP
^{13}C-2,3,7,8-TCDD 124%↑

MS ... 2,3,7,8-TCDD 122%

all MSD Surrogates out
^{13}C-2,3,7,8-TCDD at a MS

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: JA
Date: 8/9/02
DV Level: II III IV
Review Document:
✓ NFG/SW-846
___ NJDEP/SW-846
___ NFG/CLP
___ Project QAPP/SAP
___ other

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G2G090213/100235
Test Name: Dioxins/Furans
Method No.: 8280/8290/TO-9

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°C - 6°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

[illegible]	[illegible]	H.T.	[illegible]	H.T.
7/8/02	7/18/02	10 days	[illegible]	15 days
7/9/02	7/18/02	9 days	[illegible]	15 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: [illegible]

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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 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: [illegible]

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? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.6	Were there any transcription /calculation errors?			✓

Notes: No MS/MSD were submitted

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSD - All %Rs and RPDs were in control

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.	✓		
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: GW-AA-P-1-24F1 GW-AA-P-1-24F1 [illegible]

All NDs All NDs

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:_____			
9.1.2	Number of target compounds in each analysis:_____			
9.1.3	Number of results rejected and not reported:_____			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness = _____			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?		✓	

Notes: Clean up recovery was not provided, as a clean up procedure was not required for filter sample.

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mukhadle
Date: Sept 26, 2002
DV Level: II III IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number: 21560888.06003
Laboratory: STL-West Sacramento
SDG No.: G2G110177
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 7/10/02
Date Prepped - 8/1/02 22 days
Date Analyzed - 8/12/02 11 days
8/16/02 15 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: CCV 8/7 @ 11:04a ✓ CCV 8/14 @ 10:24 ✓
^{13}C-OCDD -16.9% ^{13}C-OCDD -23.2%

CCV 8/12 @ 10:51a ✓ CCV 8/16 @ 10:55 ✓
^{13}C-OCDD -22.3% ^{13}C-OCDD -20.3%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: l

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.	✓		
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mushbrackle
Date: Sept 26, 2002
DV Level: II III IV
Review Document:

____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number: 21560888.06005
Laboratory: STL-West Sacramento
SDG No.: G2G120301
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

		TCLP	
Date Sampled -	7/11/02	7/11/02	
Date Prepped -	8/5/02	8/2/02	22 days
Date Analyzed -	8/12/02, 8/27/02, 8/24/02	8/17/02	15 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		
3.7	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: CCV 8/12 @ 1051
^{13}C-OCDD -22.3% ✓
CCV 8/14 @ 1024
^{13}C-OCDD -23.2% ✓
CCV 8/26 @ 1615
^{13}C-OCDD -20.8% ✓

CCV 8/16 @ 1035
^{13}C-OCDD -20.3% ✓
8/16 @ 1028
^{13}C-OCDD -23.0% ✓

TCLP 8/15 @ 0805
^{13}C-OCDD -24.6% ✓
1,2,3,6,7,8-HxCDF 16.5% ✓
8/16 @ 0919
^{13}C-OCDD -23.6% ✓
8/23 @ 0643
^{13}C-OCDD -18.3% ✓

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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:
Method Blank
OCDD 13 ng/g
65
65 U, z

TCLP
okay

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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: TCLP 1,2,3,4,6,7,8-HpCDD / 80% ok 1,2,3,4,7,8,9-HpCDF 168%/ (53%) okay
1,2,3,7,8-PeCDD 156% / ok OCDD 0%/0% - 4x parent sample OCDF / 151% okay
1,2,3,6,7,8-HxCDD 157% / ok 2,3,4,6,7,8-HxCDF 169% / ok

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: 1,2,3,4,6,7,8-HpCDD 257% (Waste) J/
OCDD 5850%
OCDF 191% ✓

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.	✓		
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?		✓	✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mikhaelle
Date: Sept 27, 2002
DV Level: II III IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-West Sacramento
SDG No.: G26130163
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 - ~~7/12/02~~ @ 5°C
COC not relinquished / ✓

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.	✓		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	Waste		TCLP		
Date Sampled -	7/12/02		7/12/02		
Date Prepped -	8/5/02,	24 days	8/14/02	33 days *	UJ, h /
Date Analyzed -	8/25/02	20 days	8/20/02	6 days	

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		
3.7	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: CCV 8/12 @ 1051
^{13}C-OCDD -22.3%D
CCV 8/14 @ 1024
^{13}C-OCDD -23.2%D
CCV 8/25 @ 1627
^{13}C-OCDD -23.9%D
CCV 8/26 @ 1615
^{13}C-OCDD -20.8%D

Waste

CCV 8/16 @ 2228
^{13}C-OCDD -23.0%

TCLP
CCV 8/19 @ 2231
^{13}C-OCDD -19.4%D

CCV 8/22/02 @ 1851
^{13}C-OCDD -17.6%D

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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: Waste
OCDD 13ng/g 4.2

TCLP
okay

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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: TCLP - all okay

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: 1,2,3,4,6,7,8-HpCDD 257% (Waste) } J,1 (TCLP)
OCDD 5850% } J,1 okay
OCDF 191% } J,1

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: ^{13}OCDD (SO1C-R-3-0.5F7) - 20% ↓ - sample non-detect Other surrogates okay.
U.J.s OCDD + OCDF

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchadle
Date: Sept 25, 2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number: 21560888.0600
Laboratory: STL-West Sacramento
SDG No.: G2G170286
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 - 6°C

2.0 Holding Times - Reason Code: h - holding time violation.		**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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	TCLP		Waste	
Date Sampled -	7/16/02		7/16/02	
Date Prepped -	8/14/02	29 days	8/5/02	20 days
Date Analyzed -	8/20/02	6 days	8/26/02	21 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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:

TCLP

CCV 8/19/02 @ 1031
^{13}C-OCDD -19.4%

CCV 8/22 @ 06:51 pm
^{13}C-OCDD -17.6%

CCV 8/20/02 @ 11:11
^{13}C-OCDD -21.2%

Waste

CCV 8/12/02 @ 1051
^{13}C-OCDD -22.3%

CCV 8/26 @ 0334
^{13}C-OCDD -21.0%
1,2,3,4,6,7,8-HpCDD -16.0%

CCV 8/14/02 @ 1024
HpCDD total -16.0%
^{13}C-OCDD -23.2%
1,2,3,4,7,8-HxCDF - 15.5%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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:

TCLP
ok

Waste
OCDD - 13 ng/g

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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓	✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: Waste

1,2,3,4,6,7,8-HpCDD 257% ↑

OCDD 5850%

OCDF 191%

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mishacle
Date: October 1, 2002
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06002
Laboratory: STL-West Sacramento
SDG No.: G2G180210
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	Waste		TCLP	
Date Sampled -	7/17/02		7/17/02	
Date Prepped -	8/5/02	19 days	8/14/02	28 days
Date Analyzed -	8/24/02	19 days	8/20/02	6 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: Waste CCV 8/12 @ 1051
^{13}C-OCDD -22.3%
CCV 8/14 @ 1024
^{13}C-OCDD -23.2%
CCV 8/26 @ 0334
^{13}C-OCDD -21.0%
1,2,3,4,6,7,8-HpCDD -16.0%
Total HpCDD -16.0%
1,2,3,4,7,8-HxCDF +15.5%
} no associated samples

TCLP CCV 8/19 @ 2231
^{13}C-OCDD -19.4%
CCV 8/20 @ 1111
^{13}C-OCDD -21.2%
CCV 8/22 @ 1851
^{13}C-OCDD -17.6%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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: Waste
OCDD: 13mg/g ✓ U,z

TCLP
okay

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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: l

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: Waste TCLP

1,2,3,4,6,7,8-HpCDD 257% okay

OCDD 5850%

OCDF 191%

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: M Shadle
Date: October 14, 2002
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06006
Laboratory: STL-West Sacramento
SDG No.: G2G190209
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 - 6°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: WASTE TCLP

Date Sampled - 7/18/02 7/18/02
Date Prepped - 8/13/02 26 days 8/2/02, 15 days
Date Analyzed - 8/26/02, 8/27/02, 9/5/02, 9/10/02 8/17/02, 15 days

13 days, 14 days, 23 days, 28 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: WASTE: 8/26 @ 0334
^{13}C-OCDD -21%
✓ 1,2,3,4,6,7,8-HpCDD -16% ? J+/UJ
✓ TOTAL HpCDD -16%
✓ 1,2,3,4,7,8-HxCDF 15.5%
8/26 @ 1615
^{13}C-OCDD -20.8%

CCV @ 9/10 1623
^{13}C-OCDD - -19.6%
✓ 1,2,3,4,7,8-HxCDF 15.7% UJ/J
CCV 9/13 1204
^{13}C-OCDD -22.2%
no associated samples

CCV 9/5 @ 1054
✓ 1,2,3,7,8-PeCDF -16.9%
✓ PeCDF total -16.9%
✓ 1,2,3,7,8-PeCDD -17.5%
✓ PeCDD Total -17.5%
J/UJ

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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: WASTE
8/26 - OCDD 5.6 ng/g 28.0
total - HxCDF 0.71 3.55

TCLP
okay

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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: see attachment TCLP - 1,2,3,7,8-PeCDD 156%/ OCDD 0%/0%
Waste 1,2,3,6,7,8-HxCDD 157% 2,3,4,6,7,8-HxCDF 169%/
1,2,3,4,6,7,8-HpCDD 30% 1,2,3,4,6,7,8-HpCDF 168%/ (53)
OCDF /151%

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: Waste TCLP
OCDD - 288% ↑ okay

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:
TCLP
all ND

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?		✓	
8.2	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.		✓	
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: - MS

^{13}C-OCDD 161% Qu.

WASTE-Q-4-9FT

^{13}C-OCDD 216%

WASTE-Q-2-8FT

^{13}C-OCDD 394%

TCLP

Method Blank ok

^{13}C-2,3,7,8-TCDD 124%

^{13}C-2,3,7,8-TCDF 123%

WASTE-Q-4-7FT

^{13}C-1,2,3,4,6,7,8-HpCDF 121%

WASTE-Q-4-7FT DUP

- all surrogates

WASTE-Q-2-8FT

^{13}C-2,3,7,8-TCDD 125%

^{13}C-2,3,7,8-TCDF [illegible]

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mike Madle
Date: October 9, 2002
DV Level: II ~~III~~ (IV)
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.0600
Laboratory: STL-West Sacramento
SDG No.: G2G200165
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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:
Did not receive SOIL-8-6-DUP
Cooler Temp. 2°C, 3°C, 4°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	Waste		TCLP	Water
Date Sampled -	7/19/02		7/19/02	7/19/02
Date Prepped -	8/13/02	25 days	8/14/02	7/24/02
Date Analyzed -	8/24/02	11 days	8/20/02, 8/25/02	8/8/02, 8/16/02
	9/5/02	23 days		
	9/17/02	35 days		
	9/26/02	12 days		

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: Waste

CCV @ 8/24 @ 20:56 ^{13}C-OCDD -16.6%

CCV 9/5 @ 1520 ^{13}C-OCDD -20.4%

CCV 9/17/02 @ 1147 ^{13}C-OCDD -20.3%

1,2,3,6,7,8-HxPDF 16.6% UJ.6

TCLP 8/19/02 @ 2231 ^{13}C-OCDD - -19.4%

8/20 @ 11:11 ^{13}C-OCDD -21.2%

8/22 @ 1857 ^{13}C-OCDD -17.6%

Water 8/16 @ 0947 ^{13}C-1,2,3,7,8-PeCDD -16.0%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: 1,2,3,4,6,7,8- HpCDD 280%/277% J+
Waste OCDD 0%/0% >4x TCLP okay
OCDF 175%/188% J+

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: SOIL-Q-7-0.5 all ok.
WASTE-Q-6-15 (waste) 1,2,3,7,8-PeCDF >2x RL difference J/UJ → 0.18u/1.2 for TCLP ok
WASTE-Q-8-7 all ok

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?		✓	
8.2	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.	✓		
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: Waste - Q-6-15
^{13}C-OCDD 151% ↑ - previously flagged. No further data qualifying action taken.
OCDF flagged "J"

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitshadle
Date: October 15, 2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number: 21560888.06002
Laboratory: STL-West Sacramento
SDG No.: G2G230250
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	Waste		TCLP		Water	
Date Sampled -	7/22/02		7/22/02		7/22/02	
Date Prepped -	8/19/02	28 days	8/14/02	23 days	7/26/02	4 days
Date Analyzed -	8/31/02	12 days	8/20/02	6 days	8/6/02	11 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.			
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.			
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).			
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).			
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			
3.7	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: WASTE

all okay

TCLP

8/19 @ 2231
^{13}C-OCDD -19.4%

8/20 @ 1111
^{13}C-OCDD -21.2%

8/22 @ 1851
^{13}C-OCDD -17.6%

all QC

Water

8/16 @ 0947
^{13}C-1,2,3,7,8-PeCDD -16.0%

8/16 @ 1931
^{13}C-2,3,7,8-TCDF 16.3%
^{13}C-1,2,3,7,8-PeCDF 21.2%
^{13}C-1,2,3,7,8-PeCDD 17.9%
^{13}C-1,2,3,4,6,7,8-HpCDF 25.3%
^{13}C-1,2,3,4,6,7,8-HpCDD 28.2%
^{13}C-OCDD 46.7%

all QC.

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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:

WASTE: ok

TCLP: ok

water: ok

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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: WASTE okay TCCP okay Water ok

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: Waste okay TCCP okay Water 1,2,3,7,8,9-HxCDD 132% ↑ 2,3,4,7,8-PeCDF 67% ↓ WS

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?		✓	
8.2	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.		✓	
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: Water LCS
-most ISs + surrogate were low.

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: M Shadle
Date: August 15, 2002
DV Level: II (III) IV
Review Document:

___ NFG/SW-846
___ NJDEP/SW-846
___ NFG/CLP
___ Project QAPP/SAP
___ other

Project Name: Sauget Area II
Project Number: 01560888.
Laboratory: STL-West Sacramento
SDG No.: G2G240261
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

Date Sampled- 7/23/02
Date Prepped- 7/26/02 3 days
Date Analyzed- 8/6/02 11 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		
3.7	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: CCV 8/6 @ 0947

CCV - 13C - 1,2,3,7,8 - PeCDD -16.0%

CCV 8/6 @ 1931

13C - 2,3,7,8 - TCDF	16.3%	13C - 1,2,3,4,6,7,8 - HpCDF	25.3%
13C - 1,2,3,7,8 - PeCDF	21.2%	13C - 1,2,3,4,6,7,8 - HpCDD	28.2%
13C - 1,2,3,7,8 - PeCDD	17.9%	13C - OCDD	46.7%

all labeled stds [illegible] No

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: 1,2,3,7,8,9- HxCDD - 132% ↑
2,3,4,7,8 - PeCDF 67% ↓ UJ

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: 13C-2,3,7,8-TCDD 34%↓, 13C-1,2,3,7,8-PeCDD 33%, 13C-1,2,3,6,7,8-HxCDD-29%, 13C-1,2,3,4,6,7,8-HpCDD 36%
13C-2,3,7,8-TCDF 33%, 13C-1,2,3,7,8-PeCDD 37%, 13C-1,2,3,6,7,8-HxCDF 35%, 13C-1,2,3,4,6,7,8-HpCDF 38%
37C14-2,3,7,8-TCDD 34%

→ one is QC sample, no data qualifying action taken.

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchell
Date: Sept 25, 2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06002
Laboratory: STL-West Sacramento
SDG No.: G2G240266
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 - 0°C (2°-6°C)
soil sample, lower temp should have no impact on results

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 7/19/02
Date Prepared - 8/16/02 28 days
Date Analyzed - 8/31/02 15 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).	✓		
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			

Notes: see LCS

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

OCDD - 160% ↑ J+

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchell
Date: Aug 28, 2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-West Sacramento
SDG No.: G2G250332
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 - 0°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 7/24/02
Date Prepped - 8/1/02 8 days
Date Analyzed - 8/6/02 5 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓*
3.7	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: CCV - 8/6/02 @ 0947
13C - 1,2,3,7,8 - PeCDD -16% ✓
CCV - 8/6/02 @ 1931
13C - 2,3,7,8 - TCDF 16.3% ✓ 13C - 1,2,3,4,6,7,8 - HpCDD 28.2% ✓
13C - 1,2,3,7,8 - PeCDF 21.2% ✓ 13C - OCDD 46.7% ✓
13C - 1,2,3,7,8 - PeCDD 17.9% ✓
13C - 1,2,3,4,6,7,8 - HpCDF 25.3% ✓

CCV 8/9/02 @ 0852
13C - 2,3,7,8 - TCDF 21.4%
13C - 1,2,3,4,6,7,8 - HpCDF 26.0%
13C - OCDD -19.8%
CCV 8/9/02 @ 1755
13C - 1,2,3,4,6,7,8 - HpCDF 24.9%
13C - 1,2,3,4,7,8,9 - HpCDD 21.4%
OCDF 19.8%

no associated samples.

* Laboratory did not provide documentation about the S/N ratio.

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.	✓		
6.5	Were there any transcription /calculation errors?			

Notes: 1,2,3,7,8,9- HxCDF / 135% (28%)
1,2,3,4,7,8,9- HpCDF (20%)

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: For LCS
- 13C-1,2,3,4,7,8,9-HpCDF 142%/

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mesthadle
Date: Nov 5, 2002
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06004
Laboratory: STL-West Sacramento
SDG No.: GZG270187
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 6°C.

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.	✓		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 7/26/02
Date Prepped - 8/20/02, 9/10/02 4 days, 46 days* J/UJ
Date Analyzed - 8/30/02, 9/5/02, 9/6/02, 8/31/02, 9/19/02, 9/26/02
9 days 16 days
10 days, 16 days, 17 days, 11 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: CCV 9/5 @ 1520
^{13}C-OCDD -20.4%
1,2,3,4,7,8-HxCDF 16.6% J/UJ
CCV 8/30 @ 1622
1,2,3,7,8-PeCDF -20.6% J/UJ
total PeCDF -20.6% ↓

CCV 8/31 @ 0502
1,2,3,7,8-PeCDF -16.8% J/UJ
2,3,4,7,8-PeCDF -16.3%
total PeCDF -16.8%
1,2,3,7,8-PeCDD -22.1%
total PeCDD -22.1%
1,2,3,6,7,8-HxCDD 19.0% ↓

CCV 10/2 @ 0950
^{37}Cl-2,3,7,8-TCDD -19.7%
1,2,3,6,7,8-HxCDD 18.5%
1,2,3,7,8,9-HxCDD 16.4%
total HxCDD 18.5%
No associated samples.

TCLP CCV 8/19 @ 2231
^{13}C-OCDD -19.4%
CCV 8/20 @ 1111
^{13}C-OCDD -21.2%
CCV 8/22 @ 1851
^{13}C-OCDD -17.6%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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: 8/20 - ok
9/10 - ok

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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD (8/20/02) 1,2,3,6,7,8-HxCDD 748%/0%, OCDD 74X 900%/0%, 1,2,3,6,7,8-HxCDF 208%/233%, 1,2,3,4,6,7,8-HpCDF 74X/0%
2,3,7,8-TCDD /148%, 1,2,3,7,8,9-HxCDD /0%, 2,3,7,8-TCDF 147%/198%, 2,3,4,6,7,8-HxCDF 276%/295%, 1,2,3,4,7,8,9-HpCDF 74X/0
1,2,3,7,8-PeCDD /147%, 1,2,3,4,6,7,8-HpCDD 748%/0%, 2,3,4,7,8-PeCDF /151%, 1,2,3,7,8,9-HxCDF 268%/231%, OCDF 0%/1100% 74X

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

No LCS analyzed w/ batch prepped on 8/20/02. - Samples extracted on 9/10 to be used for data interpretation.

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: SOIL-Q-10-0.5

total HxCDD 1.0/1.0 ok total HxCDF 0.84/0.99 ok
1,2,3,4,6,7,8-HpCDD 14/21 ok 1,2,3,4,6,7,8-HxCDF 1.4/1.8 ok
total HpCDD 28/40 ok total HpCDF 5.7/7.2 ok
OCDF 7.0/8.4 ok

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?		✓	
8.2	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.		✓	
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	✓		
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: MSD (8/20)
^{13}C-OCDD 2050%
SOIL-Q-1-6 ^{13}C-OCDD 240% ↑ J+
WASTE-Q-1-5 ^{13}C-1,2,3,6,7,8-HxCDD 189% ↑ J+

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchadle
Date: Oct 1, 2002
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.0600
Laboratory: STL-West Sacramento
SDG No.: G2G310240, G2H010333 → G2H020286
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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:

Sample GW-AA-Q-2-60 received @ 11°C. (G2H010333)
Sample GW-AA-Q-2-130B received @ 8°C (G2H020286) only mention
Cooler Temp - 2°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 7/30/02, 7/31/02, 8/1/02
Date Prepped - 8/9/02 10 days, 9 days, 8 days
Date Analyzed - 9/5/02 27 days.

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).	✓		
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MSShadle
Date: October 16, 2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06005
Laboratory: STL-West Sacramento
SDG No.: G2H090277 & G2H100167
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 8/8/02, 8/9/02
Date Prepped - 8/28/02 20 days, 19 days
Date Analyzed - 9/14/02 17 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).	✓		
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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) - z - Method blank contamination and x - field blank contamination.		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 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:

ok ✓

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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.	✓		
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSDup - 1,2,3,7,8-PeCDD 180% / 182%
1,2,3,4,7,8-HxCDD 167% / 168%
1,2,3,6,7,8-HxCDD 134% (27%)
OCDD 130% /
2,3,7,8-TCDF 148% / 137%

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCS DUP SEEP-Q-1 SEEP-R-1

$^{37}C_{14}$-TCDD 2,3,7,8 - 155%/152% 152% 180%

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: M. Shadle
Date: November 4, 2002
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.0600
Laboratory: STL-West Sacramento
SDG No.: G2H130327
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C,

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:
Date Sampled - 8/12/02
Date Prepped - 9/10/02, 8/23 28 days 9 days
Date Analyzed - 9/25/02, 15 days, 33 days, 43 days
10/5/02

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).	✓		
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: 2,3,7,8-TCDD 144%/LCS ok; 1,2,3,6,7,8-HxCDD → J+ 399%/367%, 2,3,7,8-TCDF → J+ 442%/213% (70%)
1,2,3,7,8-PeCDD 177% LCS, 1,2,3,4,6,7,8-HpCDD 74x 0%/0%, 1,2,3,4,6,7,8-HpCDF 167%/165% - LCS ok
1,2,3,4,7,8-HxCDD LCS ok 187%/252%, OCDD 0%/0% 74x, OCDF 164%/170% - LCS ok

Samples from 8/23

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?		✓	

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MeShadle
Date: Nov. 6, 2002
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06003
Laboratory: STL-West Sacramento
SDG No.: G2H150312
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 8/14/02
Date Prepped - 9/9/02 26 days
Date Analyzed - 9/17/02, 9/18/02 8 days, 9 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).	✓		
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes:

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: l

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: SO1C-OS-2-0.5

1,2,3,4,6,7,8- HpCDD 3.0/0.3 J|UJ OCDF 2.4/0.28 J/UJ

total HpCDD 5.7/0.3

Sauget Area II

OCDD 33/2.8

total HpCDF

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: M Shadle
Date: October 17, 2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number: 21560888.06004
Laboratory: STL-West Sacramento
SDG No.: G2H160315
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.		**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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled - 8/15/02
Date Prepped - 9/9/02 25 days
Date Analyzed - 9/18/02 9 days
9/26/02 17 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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:

CCV 10/2/02 @ 0950
1,2,3,4,7,8-HxCDD 18.5%
Total HxCDD 18.5%
$^{37}C_{14}$-2,3,7,8-TCDD -19.7%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		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 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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: l		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: OCDD 3.2 / 0.52 = J/UJ

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:_____			
9.1.2	Number of target compounds in each analysis:_____			
9.1.3	Number of results rejected and not reported:_____			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness = _____			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitthadle
Date: November 4, 2002
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560885.06001
Laboratory: STL-West Sacramento
SDG No.: G2H310168
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C, 2°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:
Date Analyzed - 10/5/02, 9/26/02 17 days, 8 days
Date Prepped - 9/18/02 19 days, 15 days, 13 days
Date Sampled - 8/30/02, 9/3/02, 9/5/02

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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:

CCV 9/26 @ 1119			CCV 9/26 @ 2100			CCV 10/5/02 @ 1620		
2,3,7,8-TCDD	-18.0%	J/UJ	2,3,7,8-TCDD	-17.0%	J/UJ	^{13}C-1,2,3,4,6,7,8-HpCDD	16.1%	
total TCDD	-18.0%	J/UJ	total TCDD	-17.0%	↓			
^{13}C-1,2,3,7,8-PeCDF	-18.9%		^{13}C-1,2,3,7,8-PeCDF	-16.4%		CCV 10/5/02 @ 2301		
^{13}C-1,2,3,7,8-PeCDD	-26.4%		^{13}C-1,2,3,7,8-PeCDD	-18.5%		^{13}C-1,2,3,7,8-PeCDD	-18.4%	
			1,2,3,7,8,9-HxCDF	-16.4%	J/UJ	1,2,3,4,7,8-HxCDD	-17.6%	J/UJ
						^{13}C-OCDD	-16.3%	

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: l		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?		✓	

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

G2I120203

Reviewer: MSthadle
Date: October 31, 2002
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06002
Laboratory: STL-West Sacramento
SDG No.: G2I070159, G2I100264
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C, 4°C, 2°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

Date Sampled -	9/6/02	Date Prepared -	9/18/02	12 days	Date Analyzed - 10/15/02	27 days
	9/9/02		9/18/02	9 days	10/15/02	27 days
	9/11/02		9/18/02	7 days	10/15/02	27 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: CCV 10/5 @ 1620
^{13}C-1,2,3,4,6,7,8-HpCDD 16.1%

CCV 10/5 @ 2301
^{13}C-PeCDD 1,2,3,7,8 -18.4%
1,2,3,4,7,8-HxCDD -17.6%
^{13}C-OCDD -16.3%

No samples associated

CCV 10/15 @ 0953
2,3,7,8-TCDF -19.2%
total TCDF -19.2%
^{13}C-1,2,3,7,8-PeCDF -24.6%
^{13}C-1,2,3,7,8-PeCDD -25.3%
^{13}C-1,2,3,4,7,8-HxCDF -21.4%
1,2,3,6,7,8-HxCDD -16.9%
1,2,3,7,8,9-HxCDD -16.3%
^{13}C-OCDD 17.1%

CCV 10/15 1750
^{13}C-1,2,3,7,8-PeCDF -21.5%
1,2,3,7,8-PeCDD -17.2%
total PeCDD -17.2%
^{13}C-1,2,3,4,7,8-HxCDF -22.1%
1,2,3,4,7,8-HxCDD -16.2%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mckhadle
Date: Nov 6, 2002
DV Level: II III IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06005
Laboratory: STL-West Sacramento
SDG No.: GZI110209
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C.
Leach-R-Pt MSD - lab stated that sample may have leaked. No significant volume lost.

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:
Date Sampled - 9/10/02
Date Prepped - 9/18/02 8 days
Date Analyzed - 10/15/02 27 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: CCV 10/5 @ 1620
^{13}C-1,2,3,4,6,7,8-HxCDF 16.1%
CCV 10/5 @ 2301
^{13}C-1,2,3,7,8-PeCDD -18.4%
1,2,3,4,7,8-HxCDD -17.6%
^{13}C-OCDD -16.3%

no associated samples

CCV 10/15 @ 0953
2,3,7,8-TCDF -19.2%
total TCDF -19.2%
^{13}C-1,2,3,7,8-PeCDF -24.6%
^{13}C-1,2,3,7,8-PeCDD -25.3%
^{13}C-1,2,3,4,7,8-HxCDF -21.4%
1,2,3,6,7,8-HxCDD 16.9%
1,2,3,7,8,9-HxCDD 16.3%
^{13}C-OCDD 17.1%

CCV 10/15/02 1750
^{13}C-1,2,3,7,8-PeCDF -21.5%
1,2,3,7,8-PeCDD - -17.2%
total PeCDD -17.2%
^{13}C-1,2,3,4,7,8-HxCDF -22.1%
1,2,3,4,7,8-HxCDD -16.2%
1,2,3,6,7,8-HxCDD -17.9%
total HxCDD -16.0%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

Many MS/MSD recoveries > UCL.

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:_____			
9.1.2	Number of target compounds in each analysis:_____			
9.1.3	Number of results rejected and not reported:_____			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness = _____			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MeShadle
Date: 11/18/02
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888.06004
Laboratory: STL-West Sacramento
SDG No.: G2I190197 & G2I210262
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled	Date Prepped		Date Analyzed	
9/18/02	9/27/02	9 days	10/25/02	28 days
9/20/02			10/31/02	34 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: CCV 10/25 @ 1155
^{13}C-TCDF 18.2%
1,2,3,7,8 ^{13}C-PeCDD -21.7%
^{13}C-1,2,3,4,7,8-HxCDF -18.1%
1,2,3,6,7,8-HxCDF 19.7% J/UT
1,2,3,7,8,9-HxCDF 17.3%
1,2,3,4,7,8-HxCDD -17.3%

CCV 10/25 @ 2322
^{13}C-2,3,7,8-TCDF 25.8%
1,2,3,7,8,9-HxCDF 16.4% J/UT
1,2,3,4,7,8-HxCDD -17.2%
1,2,3,7,8,9-HxCDD -16.7%
total HxCDD -16.5%

CCV 10/31 @ 00:08
^{13}C-TCDF 30.0%
2,3,7,8-TCDD 19.2% J/UT
total TCDD 19.2%
OCDF 16.3%
^{13}C-1,2,3,4,6,7,8-HpCDF 20.2%, OCDF

CCV @ 10/31 @ 00:
^{13}C-TCDF 33.3
2,3,7,8-TCDD 20.1
total TCDD 20.1
^{13}C-1,2,3,4,7,8-HxCDF 21.6%
20.8

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			✓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓	✓	
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes:

LEACH-O-1

^{13}C-1,2,3,4,6,7,8-HpCDD 138%

^{13}C-OCDD 148%

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchell
Date: November 13, 2002
DV Level: II III IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560.888.06003
Laboratory: STL-West Sacramento
SDG No.: G2J040216
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled	Date Prepped	Date Analyzed
10/3/02	10/8/02	10/25/02

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: CCV @ 10/25 @ 11 55

^{13}C - TCDF 18.2%

^{13}C - 1,2,3,7,8 - PeCDD -21.7%

^{13}C - 1,2,3,4,7,8 - HxCDF -18.1%

1,2,3,6,7,8 - HxCDF 19.7%

1,2,3,7,8,9 - HxCDF 17.3%

1,2,3,4,7,8 - HxCDD -17.3%

10/25 @ 2322

^{13}C - TCDF 25.8%

1,2,3,6,7,8 - HxCDF 16.4%

1,2,3,4,7,8 - HxCDD -17.2%

1,2,3,7,8,9 - HxCDD -16.7%

total HxCDD -16.5%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: l

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?			✓

Notes:

2,3,4,6,7,8-HxCDF 131%/151%
1,2,3,7,8,9-HxCDF /150%
1,2,3,4,7,8,9-HpCDF 132%/143%

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MLShadle
Date: Nov 25, 2002
DV Level: II III IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number: 21560888.06004
Laboratory: STL-West Sacramento
SDG No.: G2J080173
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled	Date Prepped	Date Analyzed
10/7/02	11/6/02	11/12/02

24
6

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: CCV 11/12
1,2,3,6,7,8-HxCDD 16.6%
HxCDD 16.6%
CCV 11/15
1,2,3,6,7,8-HxCDD 17.6%
total HxCDD 17.6%
OCDF 20.4%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: 2,3,7,8-TCDD 151%/, OCDD 223%/117% (51%), 1,2,3,6,7,8-HxCDF 137%/, 1,2,3,4,6,7,8-HpCDF 163%
1,2,3,7,8-PeCDD 148%/, 2,3,7,8-TCDF 156%/, 2,3,4,6,7,8-HxCDF 160%/, 1,2,3,4,7,8,9-HpCDF 182%
1,2,3,4,6,7,8-HpCDD 170%/, 1,2,3,7,8-PeCDF 150%/, 1,2,3,7,8,9-HxCDF 162%/

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: ^{13}C-2,3,7,8-TCDD 14%/ (MS) -

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mustbradle
Date: Jan 7, 2003
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G2K080306
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 - 6°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

	Date Sampled	Date Prepared	Date Analyzed
H_2O	11/8/02	11/16	11/17
	11/8/02	11/20	12/4

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: H_2O: CCV 11/17 @ 1741
^{13}C- 1,2,3,4,6,7,8-HpCDD 15.6% IS

Soil: CCV 12/3 @ 2250
^{13}C- 1,2,3,7,8-PeCDD 27.7% - IS

CCV 11/18 @ 0407
2,3,7,8-TCDD -15.7% } J/UJ
total TCDD -15.7% }
^{13}C-OCDD 15.8% - IS

CCV 12/4 @ 1046
OCDD 19.8% J/UJ

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: SOIL OCDD 0%/0%, 2,3,7,8-TCDF ~~140%~~/139% ND, OCDF /212% (49%) } other 7ak spike amts LCS + MS met criteria, or results non-detect.
1,2,3,6,7,8-HxCDD /139% ↑, 2,3,4,6,7,8-HxCDF /164% ↑ (22%)
1,2,3,4,6,7,8-HpCDD /201% ↑ (42%), 1,2,3,4,6,7,8-HpCDF /164% (25%)

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: H_2O
LCS Dup 1,2,3,7,8-PeCDD /127% ↑ all ND.

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchadle
Date: January 17, 2003
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G2K110165
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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 8°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	Date Sampled	Date Prepped		Date Analyzed	
H_2O	11/9/02	11/16/02	7 days	11/17/02	1 day
		11/14/02	5 days	11/20/02	6 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: H_2O CCV 11/17 @ 1741
^{13}C-1,2,3,4,6,7,8-HpCDD 15.6%
CCV 11/18 @ 0407
2,3,7,8-TCDD -15.7% UJ
total-TCDD -15.7% UJ
^{13}C-OCDD 15.8%

SOIL 11/19 @ 1404
all okay
CCV 11/20 @ 0317
^{13}C-OCDD -18.5%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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:
Soil method blank
OCDD 9.3 pg/g - result <5x blank conc. No action taken

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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: SOIL - OCDD 0%/0%. J+/R-

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCSD (H_2O)
1,2,3,7,8- PeCDD /127% - Sample ND. No action taken.

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			↓
10.5	Were there any transcription /calculation errors?			

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Misshadle
Date: January 17, 2003
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G2K120279
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

	Date Sampled	Date Prepped		Date Analyzed	
Soil	11/11/02	11/14/02	3 days	11/19/02	5 days
H_2O		11/16/02	5 days	11/20/02	4 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: Soil CCV 11/19 @ 1404
OK
CCV 11/20 @ 0317
^{13}C-OCDD -18.5%

H_2O CCV 11/20 @ 0317
See Soil
CCV 11/20 @ 1643
^{13}C-OCDD -26.2%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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: Soil MB
OCDD 9.3 pg/g - result > 5x MB. No action taken.

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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: Soil
OCDD 0%/0% J+/R-

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: H_2O

LCSD - 1,2,3,7,8-PeCDD 127% - Sample ND. No action taken.

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			↓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			↓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mushadle
Date: Jan 8, 2003
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G2K130217
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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:
~~Date~~ Cooler Temp - 4°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled	Date Prepped	Date Analyzed
11/13/02	11/22/02	11/27/02
	11/26/02	12/3/02

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: H_2O - 11/27 @ 0146
^{13}C-1,2,3,7,8-PeCDD -19.4%
^{13}C-1,2,3,4,7,8-HxCDF 15.5%
^{13}C-1,2,3,4,6,7,8-HpCDF 17.1%
CCV 11/27 @ 1131
^{13}C-1,2,3,7,8-PeCDD -27.3%
^{13}C-1,2,3,4,7,8-HxCDF 18.1%
1,2,3,4,7,8-HxCDD 22.0%

Soil 12/3 @ 1801
1,2,3,7,8-PeCDD -16.2% J/UJ
total PeCDD -16.2%
1,2,3,6,7,8-HxCDF -18.9%
^{13}C-1,2,3,4,6,7,8-HpCDF 17.1%
^{13}C-1,2,3,4,6,7,8-HpCDD 24.4%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: H_2O. 1,2,3,6,7,8-HxCDD /129%, 1,2,3,7,8,9-HxCDF /148% (28%), 1,2,3,7,8,9-HxCDD /151% (21%), 1,2,3,4,7,8,9-HpCDF /136% (21%), 2,3,4,6,7,8-HxCDF /155 (27%)

SOIL 1,2,3,6,7,8-HxCDD /139%, 2,3,7,8-TCDF 140%/149%, 1,2,3,4,6,7,8-HpCDD /201% (42%), 2,3,4,6,7,8-HxCDF /164% (22%), OCDD 0%/0%, 1,2,3,4,6,7,8-HpCDF /164% (25%), OCDF /212% (49%)

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: I

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: H_2O - 1,2,3,7,8,9-HxCDD 144%↑

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			↓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: R3BM15

^{13}C-2,3,7,8-TCDF 39% UJ

^{13}C-1,2,3,7,8-PeCDF 37% UJ

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchell
Date: January 6, 2003
DV Level: II III IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G2K180141
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled		Date Prepped		Date Analyzed	
11/14/02, 11/15/02	Soil	11/26/02		Soil	12/4/02
	H_2O	11/22/02		H_2O	11/26

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.		✓	
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: CCV 12/3 @ 2250
^{13}C-1,2,3,7,8-PeCDD 27.7%
SOIL CCV 12/4 @ 1046
OCDD 19.8%
CCV 12/4 0901
^{13}C-1,2,3,4,7,8-HxCDF -20.2%

CCV 12/4 @ 1801
1,2,3,7,8-PeCDD -16.2%
total PeCDD -16.2%
1,2,3,6,7,8-HxCDF -18.9%
^{13}C-1,2,3,4,6,7,8-HpCDF 17.1%
^{13}C-1,2,3,4,6,7,8-HxCDD 24.4%
no associated samples

H2O CCV 11/26 @ 1233
^{13}C-1,2,3,4,7,8-HxCDF 22.5%
CCV 11/27 @ 0146 - more than 12 hrs.
^{13}C-1,2,3,7,8-PeCDD -19.4%
^{13}C-1,2,3,4,7,8-HxCDF 15.5%
^{13}C-1,2,3,4,6,7,8-HpCDD 17.1%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: 1,2,3,6,7,8-HxCDD / 139% ↑ 2,3,7,8-TCDF ~~140%~~ / 149% ↑ OCDF (212% (49%))
1,2,3,4,6,7,8-HpCDD / 201% ↑ (42%) 2,3,4,6,7,8-HxCDF / 164% ↑ (22%)
OCDD 0%/0% 1,2,3,4,6,7,8-HpCDF / 164% (25%)

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: H2O - 1,2,3,7,8,9-HxCDD 144% ↑ - all non-detect

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓	✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes: Soil
OCDD 12/35 = 23/23.5 = 97.8% (previously flagged).

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mbshadle
Date: Jan 8, 2003
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G2K190199
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

	Date Sampled	Date Prepped	Date Analyzed
H_2O	11/18/02	11/22/02	11/27/02
Soil		12/5/02	12/7/02

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: H_2O - CCV @ 11/27 @ 0146

^{13}C-1,2,3,7,8-PeCDD	-19.4%
^{13}C-1,2,3,4,7,8-HxCDF	-15.5%
^{13}C-1,2,3,4,6,7,8-HpCDD	17.1%

CCV 11/27 @ 1131

^{13}C-1,2,3,7,8-PeCDD	-27.3%
^{13}C-1,2,3,4,7,8-HxCDF	18.1%
1,2,3,4,7,8-HxCDD	22%

Soil - 12/7 1909

^{13}C-1,2,3,7,8-PeCDF	21.9% ✓
^{13}C-1,2,3,7,8-PeCDD	22.6% ✓
^{13}C-1,2,3,4,7,8-HxCDF	-23.7% ✓
1,2,3,7,8,9-HxCDF	20.4% ✓
^{13}C-1,2,3,4,6,7,8-HpCDF	16.6% ✓
1,2,3,4,7,8,9-HpCDF	-15.8% ✓
^{13}C-OCDD	17.1% ✓
OCDF	-15.9% ✓

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.6	Were there any transcription /calculation errors?		✓	

Notes: H_2O- 1,2,3,6,7,8- HxCDD /129%, 1,2,3,7,8,9- HxCDF /148% (28%) | 1,2,3,4,6,7,8- HpCDD 0%/0%, 1,2,3,4,6,7,8- HpCDF (22%)
1,2,3,7,8,9- HxCDD /151% (21%), 1,2,3,4,7,8,9- HpCDF /136% (21%) | OCDD 0%/0%, OCDF /22% (29%)
2,3,4,6,7,8 HxCDF /155% (27%) | 2,3,7,8- TCDF (34%)

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).	✓		
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes: H_2O- 1,2,3,7,8,9- HxCDD 144%↑ ✓

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.	✓		
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓	✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes: PIIS — All JSs low

Soil MB — ^{13}C-2,3,7,8-TCDD 39% J; ^{13}C-2,3,7,8-TCDF 38% J; ^{13}C-1,2,3,4,7,8-HxCDF 33% J

Soil - LCS — Most are low

MS/MSD — Most MSs recoveries were low

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MSHadle
Date: March 10, 2003
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G3B060194
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled	Date Prepped		Date Analyzed	
2/5/03 (H_2O)	2/18/03	13 days	2/20/03	2 days
2/10/03	↓	8 days	↓	"
2/11/03	↓	7 days	↓	"

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: CCV 2/20 @ 1311
1,2,3,4,7,8-HxCDD -18.8%
OCDF -16.0%
CCV 2/20 @ 2254
2,3,4,6,7,8-HxCDF -17.6%
1,2,3,4,6,7,8-HpCDF -16.0%
CCV 2/24/03 @ 1131
1,2,3,4,7,8-HxCDD -15.7%
CCV 2/24/03 @ 1747
1,2,3,6,7,8-HxCDF 17.5%
(associated only w/ QC samples)

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: OCDD 66% | 67%

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:

Both sampled were non-detect.

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			↓
10.5	Were there any transcription /calculation errors?			

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: MJ Shadle
Date: April 1, 2003
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-West Sacramento
SDG No.: G3B140265
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Sampled	Date Prepped	Date Analyzed
2/12/03	3/7/03	3/13/03

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).	✓		
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes:

Continuing Calibration
- CCV 3/11 @ 0827 -sh

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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:

Method Blank- 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? See tables 6I, 6J, and 6N in the project QAPP.			
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓	✗	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?		✗	

Notes:

See attached sheet.

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✗	✓	
8.2	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.		✓	✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

Several analytes analyzed which exceeded highest calibration range.

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:			
9.1.2	Number of target compounds in each analysis:			
9.1.3	Number of results rejected and not reported:			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness =			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			
10.5	Were there any transcription /calculation errors?			✓

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mcshadle
Date: March 10, 2003
DV Level: II (III) IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ other
____ NFG/CLP _____

Project Name: Sauget Area II
Project Number:
Laboratory: STL-West Sacramento
SDG No.: G3B140267
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: Date Sampled Date Prepped Date Analyzed

2/13/03 2/19/03 7 days 2/24/03 5 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ±5%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.	✓		
3.7	Were any transcription/calculationerrors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.		✓	

Notes: CCV 2/24/03 @ 1131
1,2,3,4,7,8- HxCDD -15.7%

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagentblanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive 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? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.		✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: l		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.			✓
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples: _____			
9.1.2	Number of target compounds in each analysis: _____			
9.1.3	Number of results rejected and not reported: _____			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness = _____			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	✓		
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			↓
10.5	Were there any transcription /calculation errors?			

Notes:

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: Mitchell
Date: April 21, 2003
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
___ NFG/CLP

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-West Sacramento
SDG No.: G3C130291
Test Name: Dioxins/Furans
Method No.: 8280 / 8290 / TO-9

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°C

2.0 Holding Times - Reason Code: h - holding time violation.

		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(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:
Date Sampled:
Water 3/12/03 3/20/03 8 days 3/28/03 8 days
Soil 3/19/03 7 days 3/28/03 9 days

3.0 Instrument Calibration - Reason Code: r - Initial calibration failure and c - Continuing Calibration failure.

		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.	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD ≤ 20% for the 17 target PCDD/PCDF and ≤ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).	✓		
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds ≤ 15%. Action: J(+)/UJ(-).		✓	
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? On each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5.			✓
3.7	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: CCV 3/28/03 @ 1022
^{13}C-OCDD 19.6%

CCV 3/28/03 @ 1927
^{13}C-2,3,7,8-TCDF 21.7%, ^{13}C-1,2,3,4,6,7,8-HpCDD 17.9%
^{37}Cl-2,3,7,8-TCDD 15.7%, ^{13}C-OCDD 28.4%
^{13}C-1,2,3,4,6,7,8-HpCDF 23.9%

SOIL:
Same anomalies as water.

4.0 Blanks (Laboratory and Field) - z - Method blank contamination and x - field blank contamination.

		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 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? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP.			✓
5.6	Were there any transcription /calculation errors?			✓

Notes:

6.0 Laboratory Control Sample/ Duplicate (LCS/LCSD) Reason Code: 1

		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? See tables 6I, 6J, and 6N in the project QAPP. Action: for %R > UCL, J(+) only; for %R < LCL, J(+)/UJ(-); for any %R < 30%, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes:

7.0 Field Duplicate

		Yes	No	NA
7.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
7.2	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.			✓
7.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

8.0 Sample Results/Detection Limit Verification

		Yes	No	NA
8.1	Are all sample results within the calibrated range?	✓		
8.2	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.	✓		
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
8.4	Were there any transcription /calculation errors?		✓	

Notes:

9.0 Data Completeness

		Yes	No	NA
9.1	Is % completeness within the control limits? (Control limit 95% for aqueous samples and 90% for soil samples)	✓		
9.1.1	Nunber of samples:_____			
9.1.2	Number of target compounds in each analysis:_____			
9.1.3	Number of results rejected and not reported:_____			
	% Completeness = (9.1.1 x 9.1.2 - 9.1.3) x 100/(9.1.1 x 9.1.2)			
	% Completeness = _____			

Notes:

10.0 Internal Standard, Surrogate, and Clean-Up Recovery

		Yes	No	NA
10.1	Are all samples listed on the appropriate Standard Recovery Summary Form ?	✓		
10.2	Are standard recoveries within acceptance criteria for all samples and method blanks?		✓	
10.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?		✓	
10.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)		✓	
10.5	Were there any transcription /calculation errors?		✓	

Notes:

SOIL - Q+51		Method Blank		LESDup	
^{13}C-2,3,7,8-TCDD	30% ↓	^{13}C-2,3,7,8-TCDD	36% ↓	^{13}C-2,3,7,8-TCDD	28%
^{13}C-2,3,7,8-TCDF	30% ↓	^{13}C-2,3,7,8-TCDF	35% ↓	^{13}C-2,3,7,8-TCDF	28%
$^{37}Cl_{4}$-2,3,7,8-TCDD	33% ↓			$^{37}Cl_{4}$-2,3,7,8-TCDD	30%

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.: SATIIA

1.0 Chain of Custody/Sample Condition

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

Note:

Cooler Temp: 3.7°C - 5.2°C

2.0 Holding Time

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

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

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

Note:

Date Collected	TCLP Extraction	Date Analysed	HT TCLP	HT Analysis
7/1/02	7/9/02	7/17-18/02	8 days	8-9 days
7/2/02	7/12/02	7/18/02	10 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 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: Instrument MSA5973 6/17/02 1922 I. Cal.
7/12/02 1042 TCLP Blank
7/17/02 1048
7/18/02 0943) ~~field samples, MB. TCLP blank~~

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: TCLP Blank
0709T chloromethane 0.025 mg/L (x5 → 0.125), Benzene 0.0025 mg/L (x5 → 0.0125)
0712T All NDs

Method Blank
1A0712MB All NDs
1A0717MB All NDs
1A0718MB methylene chloride 0.00824 mg/L (x10 → 0.0824 mg/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. Instrument MSA5973. All %RSDs or r^2 were in control. SPCC/CCC ok. RRF ≥0.05

6.0 Continuing Calibration

7/18/02 1046 Bromomethane -33.1%, chloroethane -24.2%, Δ Acetone 27.8%
44632A-4 Δ 2-butanone 42.1%, Δ 4-methyl-2-pentanone (55.0%), 2-Hexanone (53.4%)
44754A-1, 2. Dibromochloromethane 20.7%, 1,1,2,2-Tetrachloroethane 29.2%

		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. 7/12/02 1214 Bromomethane -34.9%, chloroethane -31.0%, acetone 46.9% ↑
↳ 0709T 2-butanone 63.3% ↑, 1,2-dichloroethane 23.1% ↑, 4-methyl-2-pentanone 78.7% ↑
(TCLP blank) trans-1,3-dichloropropene 22.3% ↑, 1,1,2-Trichloroethane 27.9% ↑
ok 2-Hexanone 75.5% ↑ ~~dichloro~~ dibromochloromethane 21.8% ↑
1,1,2,2-Tetrachloroethane 39.2% ↑
7/17/02 1222 Bromomethane -27.6%, chloroethane -20.9%, Δ Acetone (56.5%), Δ 2-butanone (67.3%)
44632A-1,2,3 Δ 4-methyl-2-pentanone (70.3%), trans-1,3-dichloropropene 22.3%
Δ 1,1,2-trichloroethane 26.9%, Δ 2-Hexanone (74.0%), dibromochloromethane 26.7%
Bromoform 26.1%, Δ 1,1,2,2-Tetrachloroethane 39.4%

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

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

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

Note:

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

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

Note: MS/MSD - 44842-1 (non-client sample) ② only spiking TCLP compounds.

2-butanone MS = 186%, MSD = 184% (42-167%).

① Parent sample is a non-client sample.

② 2-butanone results were previously flagged due to C. Cal failure.

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 - IA0712MB 2-butanone %R = 184% ↑ (42-167%) Associated sample 0709T, VK (TCLP blank)
LCS - IA0717MB) All %Rs were in control.
LCS - IA0718MB)

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:
- Several samples were diluted by a factor of 2. RLs were raised.
- Toluene conc. exceeded the linear range in sample S-2-6'-T and S-1-6'-T. Toluene was not on the routine TCLP list; therefore, a dilution of these samples was not performed and results were flagged "J, q".

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: 6

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-0-1-4'-T	WASTE-0-1-4'-T-Dup.	Difference	RL
chloromethane	0.012	0.0060	0.0060 ✓	0.02
Acetone	1.1	0.37	0.73 / NL <2xRL	0.5
CH_2Cl_2	0.014	0.013	0.001 ✓	0.10
2-butanone	0.24	0.20 U	0.24 / NL <2xRL	0.20
Benzene	0.097	0.11	0.013 ✓	0.020
MIBK	0.22	0.20	0.02 ✓	0.20
Toluene	0.063	0.063	—	
Ethylbenzene	0.17	0.17	—	
Xylene	0.98	1.0	0.02 ✓	0.04
			NL	

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.: SAI11A

1.0 Chain of Custody/Sample Condition

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

Note:

Cooler Temp: 3.7°C - 5.2°C

2.0 Holding Time

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

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

Note:

Date Collected	Date Extracted		HT	Date Analyzed	HT
	TCLP	SVOC			
7/1/02	7/8-9/02	7/9/02	7/D	7/16/02	7 days
7/2/02.	7/8-9/02.	7/9/02	6/D	7/16/02	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 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: Instrument MSD5973
7/12/02 1133 I Cal.
7/16/02 0800) field samples, dilution, MB LCS.
7/16/02 2007

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:

0709D-DFB fluid blank I bis(2-ethylhexyl)phthalate 0.0062 mg/L.
fluid blank II. All NDs. → x10 0.062 mg/L
→ 44632A-6
-6DL

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. (MSD5973) 7/12/02 2,4-dinitrophenol r^2 = 0.9889 uJ,r

All other %RSDs or r^2 were in control

6.0 Continuing Calibration

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

Note: C. Cal.

7/16/02 0821 3,3'-dichlorobenzidine -22.8%, Indeno(1,2,3-cd) pyrene -28.9%

446324-5,6,8 2,4,6-Tribromophenol -21.4% (Surrogate)

447544-3,4 ⊗ All NDs or

7/16/02 2024 3,3'-dichlorobenzidine -21.0%, △ Benzo(k)fluoranthene 44.6% ↑

446324-6DL, 7DL △ Indeno(1,2,3-cd) pyrene -35.4%

447544-3DL, 4DL

Two compounds were detected in 6DL, since these two compounds were

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:

44632A-6DL and 44632A-7DL All surrogates were diluted out, OK DF=10.

44754A-3DL, 44754A-4DL. – All base/neutral surrogate were ~~diluted out~~ not recovered. DF=5

Since only PCP was used for data interpretation, 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:

Due to insufficient sample volume, MS/MSD were not extracted in batch 0709D.

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 07090-DFB All %Rs and RPDs were in control.

⊗ only spiking TCLP compounds.

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: Isophorone conc exceeded the linear range "J,q" → This sample was not diluted and re-analyzed by the lab

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-0-1-COMP-T / Waste-0-1-comp-T-Dup.

14.0 Data Completeness

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

14.1.1 Number of samples: 6

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.: SAIIIA

1.0 Chain of Custody/Sample Condition

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

Note:

Cooler Temp: 3.7°C - 5.2°C

2.0 Holding Time

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

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

Note:

Date Collected	Date Extracted		HT	Date Analyzed	HT
	TCLP	Pesticide			
7/1/02	7/8/02	7/9/02	7/1	7/11/02	2 days
7/2/02	7/8/02	7/9/02	6/1	7/11/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

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

Note:

0709P - RFB1 All NDs) fluid blank
0709P - RFB2 All NDs)

0709P - RMB All NDs - method blank

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 - Instrument SGRGED.
7/8-9/02
All %RSDs or r^2 were in control on both columns

5.0 GC/ECD Instrument Performance Check

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

Note:

7/8/02 1732
7/11/02 1101) All %Bs were in control.

7/8/02 1732 DDT %B = 4.8%. Endrin %B = 5.2%

$$\frac{239+1301}{239+1301+30595} = 4.79\% \qquad \frac{476+1692}{476+1692+39394} = 5.22\%$$

(32135) (41562)

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:

7/11/02 1123 RTXCLP 2,4-DCAA -27.5%, TCMX -18.6%, DCBP -16.0%
RTX-CLP2 2,4-DCAA -26.2%

1733 RTX-CLP 2,4-DCAA -28.0%, TCMX -21.3%
RTX-CLP2 Methoxychlor 20.8%↑, 2,4-DCAA -25.2%
→ 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

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

Note:

WASTE-O-1-COMP-T DCBP 21%/—

WASTE-O-1 COMP-T-Dup DCBP 26%/— TCMX 29%/—
→ All ND's, 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:

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: One LCS/LCSD pair All %Rs and RPDs were in control.

10.0 TCL Identification

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

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

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

Note: WASTE-S-2-COMP-T (44632D-5) beta-BHC 0.00046 mg/L ✓ Heptachlor 0.00033 mg/L ✓

$\frac{1004 \times 0.1 \times 1}{194857 \times 0.5591 \times 2} = 0.000461$ mg/L $\frac{1398 \times 0.1 \times 1}{194857 \times 1.0805 \times 2} = 0.000332$ mg/L

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-O-1-COMP-T WASTE-O-1-COMP-T-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: WASTE-O-1-COMP-T RTX-CLP 295669 (229.7%)↑ (64366 - 193098)

WASTE-O-1-COMP-T-Dup 302440 (234.9%)↑

① All NDs in these two samples, 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
PCB ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII11

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp. 3.7-5.2°C

2.0 Holding Time

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

Matrix	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.	TCLP Extraction	H.T	Extraction	H.T	Analysis	H.T.
7/1/02	7/8-9/02	7-8 days	7/9/02	—	7/11/02	2 days
				DL-	7/23/02	14 days
7/2/02.	7/8-9/02	6-7 days	7/9/02	—	JA ~~7/11/02~~ 7/23/02	12 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for 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: MS65972

6/28/02 0915 I. Cal.
7/22/02 0720 I. Cal
7/11/02 0577) field samples
7/23/02 1442 –

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.		[✓]	✓ NA

Note:

0709G-KFB All NDs – Fluid Blank 1

0709G-KFB All NDs – Fluid Blank 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 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.		[✓]	✓ SA

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

MSK5972 I. Cal 6/28/02 All %RSDs <15%.

7/22/02 All %RSDs <15%.

6.0 Continuing Calibration

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

Note: C. Cal. 7/11/02 0620. All %Ds < 20%.

7/11/02 1410.

7/23/02 1542 All RRF > 0.05

7/24/02 0058.

.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.		[✓]	⑦ ✓

Note: ⑦ use $^{13}C_{12}$-Decachlorobiphenol (30-130%).

All %Rs were in control.

.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

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

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

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

Note: No MS/MSD in this SDG. See LCS/LCSD

9.0 Laboratory Control Sample (LCS)

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

	> 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: One LCS/LCSD pair, all %Rs and RPDs were in control.

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[✓]	✓ (2)

Note: Monochlorobiphenyl in sample WASTE-0-3-COMP-T exceeded the linear range - J,J

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:

	0-1-COMP-T	0-1-COMP-T-DUP.	RPD
Mono-	0.050	0.039	25%
Dichloro	0.013	0.0098	28%
Trichloro	0.0035	0.0025	33%

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:

WASTE-0-3-COMP-T

Mono-	0.033 mg/L	$\frac{(905322 + 20176 + 108954) \times 0.75}{67735 \times 1.72864 \times 200} = 0.0331$ mg/L
Di-	0.0077 mg/L	$\frac{(47123 + 83857 + 10865 + 15163) \times 0.75}{67735 \times 1.13829 \times 200} = 0.00764$ mg/L
Tri	0.00018 mg/L	$\frac{(5724 + 4180) \times 0.75}{67735 \times 0.80720 \times 200} = 0.000679$ mg/L

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.: SAI11A

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: 3.7°C – 5.2°C

2.0 Holding Time

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

Matrix	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	Herbicide			
7/1/02	7/8/02	7/9/02	7/1 days	7/24, 26/02	15, 17 days
7/2/03	7/8/02	7/9/02	6/1 days	7/23, 26/02	14-17 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 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: 0709N-FB1 All NDs ; 0709N-FB2 All NDs
0709N-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 (SGSZCD).
All %RSDs < 20% on both columns.

5.0 Continuing Calibration

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

447540-3, 4

Note: 7/23/02 1412 DB-XLB 2,4,5-T 16.3% J,C
7/26/02 1251 DB-XLB 2,4-D 18.6%, PCP 17.5%, 2,4,5-TP 17.7% 2,4,5-T 16.9%
7/26/02 1721 DB-XLB Dicamba 15.6%, PCP 18.0%, 2,4,5-TP 16.6%

6.0 Surrogate Recovery

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

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

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

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

Note: WASTE-0-1-COMP-T 2,4'-DCAA 2150%, WASTE-0-1-COMP-T-Dup 2,4-DCAA 2500%
WASTE-0-1-COMP-T 2,4'-DCAA 5500% WASTE-0-3-COMP-T 2,4-DCAA 2500%.
0-1-COMP-T (DF=10), 0-1-COMP-T-Dup (DF=10), and 0-3-COMP-1 (DF=20) → surrogates 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: See LCS/LCSD pair

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.	[✓] (A)	✓ (A)	

Note:

	0-1-COMP-T	0-1-COMP-T-Dup.	RPD / Difference	RL
2,4-D	1.4	2.4	52.6% / NC	
PCP	1.4	2.4	52.6% / NC	
2,4,5-TP	0.0041	0.025 U.	0.0028 mg/L	0.025
2,4,5-T.	0.65	0.99	41.5%	

12.0 Data Completeness

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

12.1.1 Number of samples: 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:

Column: WASTE-0-1-COMP-T

P (10XDL) 2,4-D 1.4 mg/L ✓ $\frac{35936265 \times 10}{2485279 15} = 1.446$ mg/L

P (10XDL) PCP 1.4 mg/L ✓ $\frac{4 68 783028 \times 10}{3304695707} = 1.419$ mg/L

C 2,4,5-TP 0.0041 mg/L ✓ $\frac{6661844 \times 1}{1611954999} = 0.00413$ mg/L

P (10XDL) 2,4,5-T 0.65 mg/L ✓ $\frac{77519923 \times 10}{1199737009} = 0.646$ mg/L

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

SDG No.: SAI11A
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

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

Note: Cooler temp: 3.7°C – 5.2°C

2.0 Holding Time

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

Note:

Date Collected	TCLP Extraction	H.T.	Extraction	H.T	Analyzed	H.T.
7/1/02	7/8/02	7	7/11/02	3 days	7/18/02	JA ~~2~~ 7 days
7/2/02	7/8/02	6	7/11/02	3 days	7/18/02	7 days.

3.0 Method Detection Limits (MDL)

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

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).		✓					✓					
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.		✓						✓				

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

Note: CRDL
Pb – / 130% ↑
Hg r = 0.999985 / AK
Ca CCV3 111%, CCV4 113%
CCV5 113%, CCV6 113%
↳ J(+), c

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: MS/MSD were not preformed.

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.		✓	~~✓~~ NA					✓				

Note: WASTE-O-1-COMP-T

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: 6												
12.1.2	Number of target compounds in each analysis: 2												
12.1.3	Number of results rejected and/or not reported: 22												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

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

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI17A

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	TCLP Extraction	Date Analysed	HT
7/11,12/02	7/17/02	7/30,31/02	13-14 days
	H.T 5-6 days		

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for 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: 6/17/02 1922. I Cal
7/30/02 0803) QC, field samples
7/31/02 1213

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:

TCLP Blank - 0717T chloromethane 0.039 mg/L, CH_2Cl_2 0.026 mg/L
2-butanone 0.040 mg/L, 4-methyl-2-pentanone 0.058 mg/L

Method Blank - 1A0730MB chloromethane 0.0053 mg/L, CH_2Cl_2 0.047 mg/L

1A0731MB CH_2Cl_2 0.025 mg/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. 6/17/02 (MSAS973) 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:

7/31/02 1314 Bromomethane -49.0%, Acetone 50.7%↑, 2-butanone 52.8%
4-methyl-2-pentanone 61.4%, 2-Hexanone 62.8%
Dibromochloromethane 22.7%, Bromoform 22.3%
1,1,2,2-Tetrachloroethane 37.4%.

7/30/02 0829 chloromethane -21.5%, Acetone 25.7% 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/MSD - 45160A-1

2-butanone. MS = 174% (42-167%) RPD = 40% (<31%)

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 33

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

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

% Completeness = 100%

Note:

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

Reviewer: TA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA-I17A

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
	TCLP	SVOC			
7/11,12/02	7/18/02	7/18/02	6-7 days	7/29-31/02	11-13 days

3.0 GC/MS Instrument Performance Check (IPC)

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

Note:

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- 07186-DFB
Benzo(k)fluoranthene 0.0043 mg/L
Indeno(123-cd)pyrene 0.015 mg/L
Dibenzo(a,h)anthracene 0.014 mg/L
Benzo(g,h,i)perylene 0.017 mg/L

Fluid Blank- 07186DFB2
Indeno(123-cd)pyrene 0.0086 mg/L
Dibenzo(a,h)anthracene 0.0077 mg/L
Benzo(g,h,i)perylene 0.010 mg/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 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 7/27/02 All %RSDs or r^2 were in control.
(MSD5973) 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:

7/29/02 1103 All %Ds <20% RRF >0.05
(MSD5973)

7/30/02 1041 All %Ds <20% RRF >0.05

7/31/02 0929 All %Ds < 20% RRF >0.05

7.0 Surrogate Recovery

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

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

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

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

Note:

45005-2 WASTE-R-4-COMP-TDL DF=5 base/neutral surrogate diluted out ~~J/UJ~~ only three acid compounds used

44968-3 WASTE-R-2-COMP-TDL DF=25) All ~~SSD~~ surrogates were diluted out JK

44968-4 WASTE-R-1-COMP-TDL DF=10)

45005-3 WASTE-R-3-COMP-TDL DF=5 one acid surrogate and all base/neutral surrogates were not recovered. 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.

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

Note:

No MS/MSD - use 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:

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:

Several results exceeded the linear range → J, g

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: 4 + 4DL.

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.: SAI17A

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
	TCLP	Pesticide			
7/11,12/02	7/18/02	7/18/02	6-7 days/0	7/22/02	4 days
7/12/02	7/26/02	7/26/02	14 days/0	8/2/02	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 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:

Fluid Blank - 0718P-RFB1 All NDs
Fluid Blank - 0718P-RFB2 All NDs
Fluid Blank - 0726P-RFB All NDs

Method Blank - 0718P-RMB All NDs
0726P-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 (SGREC0) 7/8-9/12 All % RSDs or r^2 were in control
7/25/12 All % RSDs or r^2 were in control

5.0 GC/ECD Instrument Performance Check

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

Note:

7/8/02 1732
7/22/02 1414
7/25/02 1321
8/2/02 1357

All %Ds were in control

6.0 Continuing Calibration

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

Note:

7/22/02 1436 alpha-BHC -18.5%/—, delta-BHC -18.4%/—, 4,4'-DDD -16.6%/—
449680-3 Methoxychlor —/38.1%, TCMX -20.0%/—
7/22/02 2019 alpha-BHC -17.6%/—, delta-BHC -16.5%/—, Methoxychlor —/43.4%
450050-3 -4 2,4-DCAA -18.2%/~~-15.1%~~, TCMX -21.0%/—
8/2/02 1517 4,4'-DDE -23.9%/—, 4,4'-DDT —/18.5%, Methoxychlor 25.8%/20.6%
TCMX -16.2%/—
450650-2 8/3/02 0038 Heptachlor —/18.6%, Dieldrin —/16.0%, Endrin 16.0%/17.0%,
4,4'-DDD —/19.7%, 4,4'-DDT 19.8%/26.1%, Endosulfan sulfate —/19.7%
Methoxychlor 44.7%/42.0%, Endrin ketone 19.1%/21.3%, 2,4-DCAA -19.5%/-15.8%
TCMX -15.5%/—

7.0 Surrogate Recovery

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

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

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

Note:

0718P-RMB TCMX 13%/15% ↓
0718P-RFB TCMX 18%/10% ↓ QC samples, ok
0718P-RMBLCS TCMX 27%/— ↓

450054-3 TCMX —/25% ↓ → only one recovery 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: No MS/MSD - use 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

		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 results 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:

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
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI17A

1.0 Chain of Custody/Sample Condition

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

Note:
Cooler Temp:

2.0 Holding Time

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

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

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

Note:

Date Collected	Date Extracted	HT	Date Analyzed	HT
TCLP Herbicide				
7/11,12/02	7/19	7/19	7-8 days	7/25, 8/2	6, 14 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze 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- 0719N-SFB1 PCP 0.0046 mg/L, 0719N-SFB2 PCP 0.0072 mg/L
Method Blank- 0719N-SMB All NDs.
⊗ PCP was either ND or greater than 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. (SGS GCD) 7/22-23/02 All %RSDs or r^2 were in control on both columns.

5.0 Continuing Calibration

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

Note: 7/24/02 2056 All %Ds < 15% on both columns
7/25/02 0743 PCP 16.9%/— → J.C — J.C
8/2/02 1242 MCPP 19.4%/—, 2,4-D 16.7%/—, PCP 15.5%/—
8/2/02 2307 MCPP 18.9%/—, 2,4-D 15.7%/—, 2,4-DB —/-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(-)

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

Note:

0719N-SMB	2,4DCAA	22%/22%.	QC	
45005A-2	2,4-DCAA	—/0%.	DF=1	J/R
44968A-3	2,4-DCAA	0%/0%	DF=100, NC	
44968A-4	"	0%/0%.	DF=100, NC	

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:

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:

PCP in 45005D-2 and 2,4-D in 45005D-3 → RPD > 40%.
J, c due to calibration failure, JK

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: 11

12.1.3 Number of results rejected and/or not reported: 9

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

% Completeness = 79.5%.

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.: SAI 17A
Lab: STL Savannah

1.0 Chain of Custody/Sample Condition/Raw Data

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

Note:

2.0 Holding Time

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

Note:

	Date Collected	Date Analyzed.	HT
ICP	7/11,12/02	7/25/02	13,14 days
Hg	7/11,12/02	8/1/02	20-21 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

7/17/02 As 122%/122%

As 132%/79%.

7/26/02 Tl 134%/—

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: Post-digestion Spike - WASTE-R-2-COMP-T) All %Rs were in control
WASTE-R-4-COMP-T.)

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 WASTE-R-2-COMP-T
WASTE-R-4-COMP-T.

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: 4												
12.1.2	Number of target compounds in each analysis: 22												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

DATA VALIDATION WORKSHEET - 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.: SAI21A

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	TCLP Extraction	Date Analysed	HT
7/16/02	7/24/02	7/29/02	3-5 days
7/17/02	7/26/02		

H.T. 8-9 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: TCLP Blank- 0724T chloromethane 0.026 mg/L, acetone 0.49 mg/L, CH_2Cl_2 0.026 mg/L 2-butanone ~~0.026~~ 0.067 mg/L, Toluene 0.0079 mg/L 2-Hexanone 0.024 mg/L

TCLP Blank - 0726T chloromethane 0.044 mg/L, CH_2Cl_2 0.021 mg/L

method Blank - IA0729MB chloromethane 0.0073 mg/L, CH_2Cl_2 0.023 mg/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:

J. Cal 6/17/02 All %RSDs or r^2 were in control
(MSA 5973)

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:

7/29/02 1106 Acetone 52.3%, CH_2Cl_2 25.6%, 2-butanone 33.1%.
4-methyl-2-pentanone 25.5%, 2-Hexanone 34.0%,
~~dichloroche~~ dibromochloromethane 31.4%
(JH)

UJ, C

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/MSD - 45460A.
2-butanone MS = 168% (42-167%) RPD = 40% (<31%)

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%).

Positive results were previously flagged due to method blank contamination, OK!

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: 5

14.1.2 Number of target compounds in each analysis: 33

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

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

% Completeness = 100%

Note:

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

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI2/A

1.0 Chain of Custody/Sample Condition

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

Note:

Cooler Temp:

2.0 Holding Time

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

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

Note:

Date Collected	Date Extracted		HT	Date Analyzed	HT
	TCLP	SVOC			
7/16-17/02	7/23/02	7/23/02	6-7/0	7/30/02	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 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:

Fluid Blank- 0723F-DFB

Benzo(k)fluoranthene 0.0050 mg/L
Indeno (1,2,3-cd) pyrene 0.013 mg/L
Dibenzo (a,h) anthracene 0.0090 mg/L
Benzo(g,h,i) perylene 0.012 mg/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 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 (MSD5773) 7/27/02 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:

7/30/02 1041 All %Ds < 20% RRF >0.05

7/31/02 0929 All %Ds < 20%, RRF >0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

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

Note:

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

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

Note:

No MS/MSD - 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:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: 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.: SAI21A

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
	TCLP	Pesticide			
7/16,17/02	7/23/02	7/23/02	6-7 days	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:

Fluid Blank - 0723P-IFB All NDs.

Method Blank - 0723P-IMB All NDs.

4.0 Initial Calibration

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

Note:

I. Cal (SGIECD) All %RSDs or r^2 were in control on both columns.
6/26-27/02

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:

6/26/02 1145) %D's were in control.
7/26/02 0945

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:

7/26/02 1009 4,4'-DDT -15.7%/—, 2,4-DCAA -26.4%/-33.4%, TCMX -16.0%/—

7/26/02 2120 Heptachlor -21.5%/—, 4,4'-DDT —/-16.0%, Methoxychlor —/-22.9%
2,4'-DCAA -23.2%/-38.3%, DCBP—/-17.8%.

All NDs in associated samples, ok

7.0 Surrogate Recovery

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

0723P-IFB TCMX 27%/26%.
0723P-IMBLCS DCBP —/28%
0723P-IMBLCSD DCBP —/26%.
QC samples, ok
45735-A-4 DCBP —/29% → only one surrogate 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: No MS/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

		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. 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: _____

13. Internal Standards

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

Note: _____

14.0 Data Completeness

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

14.1.1 Number of samples: 5

14.1.2 Number of target compounds in each analysis: 21

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

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

% Completeness = 100%.

Note:

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

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI21A

1.0 Chain of Custody/Sample Condition

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

Note:

Cooler Temp:

2.0 Holding Time

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

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

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

Note:

Date Collected	Date Extracted		HT	Date Analyzed	HT
	TCLP	Herbicide			
7/16, 17/02	7/24	7/24	7-8 days	7/27/02	3 days

3.0 Blanks (Method Blanks and Field Blanks)

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

Note: Fluid Blank - 07240-SFB All NDs
Method Blank - 07240-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. (SGSECD) 7/22-23/02 All %RSDs or r^2 were in control on both columns.

5.0 Continuing Calibration

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

Note:
7/27/02 0325 All %Ds <15% on both columns.
7/27/02 1411 2,4-DB —/-16.9% → J.C on WASTE-P-3-COMP-T

6.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note:

No MS/MSD

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: PCP conc in WASTE-P-3-COMP-T exceeded the linear range – J'g no dilution
2,4,5-T and 2,4-D13 → RPD >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	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be 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: 11

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.: SAI21A
Lab: STL Savannah

1.0 Chain of Custody/Sample Condition/Raw Data

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

Note:

2.0 Holding Time

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

Note: Date Collected Date Analyzed. H.T

ICP 7/16,17/02 7/25-26/02 8-10 days
Hg 7/16,17/02 8/2/02 16,17 days

3.0 Method Detection Limits (MDL)

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

Note:

4.0 Instrument Calibration

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

Action:

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

Note: CRDL

As 69%/ — J/UJ, W.

Pb 128%/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.	✓	≠	7A					✓				
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.	✓	≠	7A					✓				

		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: Lab dup - LCS/LCSD

9.0 Spike Sample Analysis -Pre-Digestion

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

Note: MS/MSD - See original data package.

Post-digestion spike - WASTE-P-1-COMP-T 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-P-1-COMP-T.

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: 5												
12.1.2	Number of target compounds in each analysis: 22												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%.												

Note:

DATA VALIDATION WORKSHEET - 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.: SAI26A

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 - 5.1°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	TCLP Extraction	Date Analysed	HT
7/16,18,19/02	7/24/02	7/29-31/02	5-7 days
	7/26/02		
	H.T 8-10 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:

~~I. Cal~~	6/17/02 1922	I. Cal
Ⓐ	7/29/02 1038	
MSAS913	7/30/02 0803	QC field samples.
	7/31/02 1213	

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

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?	✓	[ ]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[ ]	✓
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓

Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines

4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

Method Blank - IA0729MB chloromethane 0.0073 mg/L, methylene chloride 0.023 mg/L
Method Blank - IA0730MB chloromethane 0.0053 mg/L, methylene chloride 0.047 mg/L
Method Blank - IA0731MB methylene chloride 0.025 mg/L

45160A-1/2 → TCLP Blank - 0724T chloromethane 0.026 mg/L, acetone 0.49 mg/L, methylene chloride 0.026 mg/L, 2-butanone 0.067 mg/L, Toluene 0.0079 mg/L. U,Z
3/4

45219C-1/2 → TCLP Blank - 0726T chloromethane 0.044 mg/L, methylene chloride 0.021 mg/L → U,Z
45303D-1/2

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 >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: MSA5973 6/17/02 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:

7/29/02 1106 Acetone 52.3% ↑ UJ/J, Methylene Chloride 25.6% ↑, 2-butanone 33.1% ↑ J
4-methyl-2-pentanone 25.5% ↑ J, 2-Hexanone 34.0% ↑,
dibromochloromethane 31.4%.
7/30/02 0829 chloromethane −21.5% ↓, Acetone 25.7% ↑. J
7/31/02 1314 Bromomethane −49.0% ↓, Acetone 50.7% ↑, 2-butanone 52.8% ↑ J
4-methyl-2-pentanone 61.4% ↑, 2-Hexanone 62.8%,
dibromochloromethane 22.7% ↑, Bromoform 22.3% ↑, 1,1,2,2-TCA 37.4% ↑

7.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note:

MS/MSD - 45760A 2-butanone MS = 168% / ~~140%~~ ↑ (42-167%)

RPD = 40% (<31%)

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% ↑ (42-167%).

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: 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: 8

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-4-7	WASTE-Q-4-7-Dup.	Difference.	RL
chloromethane	0.022	0.026	0.004	0.02
CS_2	0.022	0.024	0.002	0.02
2-butanone	0.042	0.032	0.008	0.20
MIBK	0.014	0.048	0.034	0.20

	WASTE-Q-8-7	WASTE-Q-8-7-Dup.	Difference	RL
chloromethane	0.043	0.038	0.005	0.02
CS_2	0.032	0.024	0.032	0.02
CH_2Cl_2	0.054	0.026	0.028	0.02
2-butanone	0.10	0.071	0.029	0.20
Benzene	0.0065	0.0079	0.0014	0.02
MIBK	~~0.0073~~ 0.020 JA	~~0.0066~~ 0.011 JA	0.009	0.20
Toluene	0.0073	0.0066	0.0007	0.02
1,2-DCE	0.040	0.0047	0.0047	0.04.

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.: SAI26A

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

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:

Fluid Blank - 0723F-DFB Benzo(k)fluoranthene 0.0050 mg/L, Indeno(1,2,3-cd)pyrene 0.013 mg/L, Dibenzo(a,h)anthracene 0.0090 mg/L Benzo(g,h,i)perylene 0.012 mg/L.

Fluid Blank - 0724A-DFB Indeno(1,2,3-cd)pyrene 0.0043 mg/L, Dibenzo(a,h)anthracene 0.0040 mg/L, Benzo(g,h,i)perylene 0.0052 mg/L

⊗ All NDs in associated samples. OK

5.0 GC/MS Initial Calibration

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
5.2	Are calibrations linear 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. 7/27/02 (MSD5973). 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: 7/28/02 1048 2,4-dinitrophenol 33.8%

7/29/02 1103 All %Ds < 20% RRF > 0.05

7/30/02 1041 All %Ds < 20% RRF > 0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

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

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

Note:

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 MS = 48% ↓ (49-121%).

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: RCP in sample WASTE-Q-2-COMP-T. exceeded the linear range. J.g.

13.0 Field Duplicate Samples

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

Note: WASTE-Q-4-COMP-T / WASTE-Q-4-COMP-T-DUP. All NDs.
WASTE-Q-8-COMP-T / WASTE-Q-8-COMP-T-DUP. See next page.

14.0 Data Completeness

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

14.1.1 Number of samples: 8

14.1.2 Number of target compounds in each analysis: 65

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

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

% Completeness = 100%

Note:

	Q-8-COMP-T	Q-8-COMP-T-DUP.	Difference	RL
1,4-DCB	0.026	0.05U.	0.026	0.05
Naphthalene	0.013	0.05U.	0.013	0.05
Diethylphthalate	0.012	0.0074	0.0046	0.05
Butylbenzylphthalate	0.0038	0.05U	0.0038	0.05

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.: SAI26A

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°C – 5.1°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
	TCLP	Pesticide			
7/16-18/02	7/24/02	7/24/02	6-8/0	8/4/02	11 days
	7/23/02	7/23/02	5-7/0		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?		[✓]	✓ NA
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:

Fluid Blank - 0723P- MFB All NDs

Fluid Blank - 0724N-MFB All NDs

Method Blank - 0723P MMB All NDs

Method Blank - 0724N-MMB All NDs

4.0 Initial Calibration

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

Note:

I. Cal. (SGMECD) All %RSDs or r^2 were in control. on both columns.

5.0 GC/ECD Instrument Performance Check

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

Note: _____

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? every 12 hours. JK (7A)	[✓]		
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 2052 alpha-BHC -19.7%/—, gamma-BHC -16.8%/—, delta-BHC -17.0%/-16.6%
Heptachlor epoxide -18.2%/—, 4,4'-DDT 28.4%/—, 2,4-DCAA —/-17.2%
TCMX -36.6%/-24.5%.

8/4/02 0722 Heptachlor 19.9%/—, 4,4'-DDT 29.0%/16.1%, Endosulfan Sulfate —/15.5%,
2,4-DCAA —/-16.0%, TCMX -22.3%/~~-15.3%~~

7.0 Surrogate Recovery

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

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

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

Note:

0723P-MFB TCMX 25%/29%
45160A-5 TCMX 24%/27%
45160A-8 TCMX 26%/28%.
45160A-7 MSD TCMX 0%/0%. → QC sample, poor extraction efficient.

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.

Heptachlor MSD = 0%, RPD = 200% (37-148%, 26%)
Heptachlor-epoxide MSD = 0% RPD = 200% (43-141%, 31%)
Endrin MSD = 32% RPD = 88%. (41-158%, 25%).
gamma-BHC RPD = 41% (<36%)

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: Heptachlor in 4560A-8 RPD = 102.2%. → result previously flagged due to calibration failure, JK.

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-4-COMP-T / WASTE-Q-4-COMP-T-Dup. All NDs
WASTE-Q-8-COMP-T / WASTE-Q-8-COMP-T-Dup 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: 0724N-MF13 24833 ↑ 150.3% ≈150%. JK
@ QC sample.

14.0 Data Completeness

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

14.1.1 Number of samples: 8

14.1.2 Number of target compounds in each analysis: 21

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

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

% Completeness = 100%

Note: _____

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

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA126A

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°C – 5.1°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
	TCLP Herbicide			
7/16-18/02	7/24/02 7/24/02	6-8 days	7/27/02	3 days

3.0 Blanks (Method Blanks and Field Blanks)

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

Note: FluidBlank -07240-SFB1 All NDs, fluid blank -07240-SFB2 All NDs
Method Blank - 07240 -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 7/22-23/12 All %RSDs or r^2 were in control on both columns.

5.0 Continuing Calibration

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

Note: 7/27/12 0325 All %Ds <15% on both columns.
7/27/12 1411 2,4-DB —/-16.9%
↳ ND in associated samples, ok

6.0 Surrogate Recovery

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

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

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

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

Note: _____

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

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

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

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

Note: _____

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

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

Note: _____

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".	[✓]		✓ (A)
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

PCP in 45160D-7 exceeded the linear range
several results had 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	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be 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-4-COMP-T / WASTE-Q-4-COMP-T-DUP All NDs.

WASTE-Q-8-COMP-T / WASTE-Q-8-COMP-T-DUP. PCP 0.010 / 0.050 U. / ug

12.0 Data Completeness

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

12.1.1 Number of samples: 8

12.1.2 Number of target compounds in each analysis: 11

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.: SAI26A
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°C - 5.1°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:

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%
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: _____

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: Lab dup - use MS/MSD.
WASTE-Q-2-COMP-T K RPD = 22.4%. ~~J(+)~~ TA J.ke See serial dilution section.
WASTE-Q-8-COMP-T All RPDs were in control.
WASTE-Q-2-Comp-T.

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-2-COMP-T.
Zn MS = 44% ↓. 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: Serial Dilution K = 11.4% 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: _____

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.: SAI21A

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

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
7/22/02	7/30	7/31/02	1 day

H.T 8 days

3.0 GC/MS Instrument Performance Check (IPC)

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

Note:

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:

TCLP ~~Method~~ Blank - 0730T chloromethane 0.054 mg/L, CH_2Cl_2 0.030 mg/L
2-butanone 0.067 mg/L, 4-methyl-2-pentanone 0.053 mg/L
2-Hexanone 0.072 mg/L, 1,1,2,2-Tetrachloroethane 0.0066 mg/L

Method Blank - 1A0731MB. CH_2Cl_2 0.025 mg/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. (MSA5973) 6/17/02 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:

7/31/02 1314 Bromomethane -49.0%, Acetone 50.7%, 2-butanone 52.8%
4-methyl-2-pentanone 61.4%, 2-Hexanone 62.8%,
dibromochloromethane 22.7%, Bromoform 22.3%,
1,1,2,2-Tetrachloroethane 37.4%.

7.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note:

MS/MSD - 45219-1 2-butanone RPD = 35% (< 31%)

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: 2

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: TA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI 31A

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
	TLP	SVOC			
7/22/02	7/31/02	7/31/02	9 days	8/5/02	5 days
				8/9/02 → Dilution	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:

Fluid Blank - 0731B - JFB 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. 8/2/02 All %RSDs or r^2 were in control
(MSJ5971)

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:

8/5/02 1337. Indeno (1,2,3-cd) pyrene -28.5%.

8/9/02 1527 ~~bis(2-ethe~~ bis (2-chloroiso propyl) ether -33.4%
2,4-dinitrophenol 26.2%

⊗ All NDs for these outliers, no action was taken.

7.0 Surrogate Recovery

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

45229A-3 DL nitrobenzene-d5 0%, Terphenyl-d14 0%
base/neutral.

DF = 4

⊛ Since only pentachlorophenol (a acid fraction compound will be used for data interpretation, ok.

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

PCP in 452290-3 exceeded linear range. J.g. use diluted data.

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: 2

14.1.2 Number of target compounds in each analysis: 65

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

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

% Completeness = 100%

Note:

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

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI 3/A

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
	TCLP	Pesticide.			
7/22/02	7/31/02	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:

Fluid Blank – 0731P-JFB All NDs

Method Blank – 0731P-JMB ~~All %Rs were in control.~~ 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 (SGJ ECD) 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.
8/6/02 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 TCMX —/-17.6%
8/7/02 0236 Aldrin 15.7%/— , TCMX —/-19.3%

⊛ Aldrin was ND in associated samples, 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.) 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:

0731P-JMBLCSD. DCBP 28%/25%)

D QC sample
②

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. All NDs	[ ]		✓
11.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
11.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note:

12.0 Field Duplicate Samples

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

Note:

13. Internal Standards

		Yes	No	NA
13.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? For Area > 150%, J(+) only. For Area < 50%, J(+)/UJ(-).	[ ]	✓	

If extremely low area counts are reported (i.e., < 10%), or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

Note: 45229D-3 peak area 49947626 ↑ (15225744 - 45677234)
↳ OK confirmation column (164.0%)
⊗ All NDs 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: 2

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
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date: _____
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI31A

1.0 Chain of Custody/Sample Condition

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

Note:
Cooler Temp:

2.0 Holding Time

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

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

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

Note:

Date Collected	Date Extracted		HT	Date Analyzed	HT
	TCLP	Herbicide			
7/22/02	8/2/02	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: Fluid Blank - 0802N-SFB All NDs
Method Blank - 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 or r^2 were in control on both columns
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	verification.		[ ]	✓

Note:
8/8/02 1037 dalapon 22.3%/17.6%, MCPP 18.6%/—, MCPA —/19.3%
2018 dalapon 20.5%/19.1%, MCPP 23.1%/—, MCPA 18.4%/24.4%
Dinoseb 17.3%/—
Fluid blank → 8/13/02 1601 MCPP 17.1%/—, 2,4-DB 18.2%/20.7%, Dinoseb —/15.7%

6.0 Surrogate Recovery

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

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

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

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

Note: 45-229A-3 2,4-DCAA 700%. J(+)

0802N-SFB 2,4-DCAA 170%. QC sample, 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.

		Yes	No	NA
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	judgement. For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.	[ ]		✓

Note: _____

12.0 Data Completeness

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

12.1.1 Number of samples: 2

12.1.2 Number of target compounds in each analysis: 11

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.: SAI 31A
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

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

Note:

2.0 Holding Time

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

Note:

	Date Collected	Date Analyzed.	H.T
ICP	7/22/02	8/2/02	11 days.
Hg	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%).	✓						✓					
4.6	Was a CRDL standard (CRI or CRA) run and verified for each analyte?	✓						✓					
4.7	Was the CRI analyzed at the beginning of the sequence and at every eight hours or less?	✓											
4.8	Was the CRA run after the ICV at the beginning of the run?							✓					
	If %R for CRI or CRA is outside the acceptance criteria (no limit specified in NFG, use 80 - 120%), make a note in the data validation report. Qualify if professional judgement deems necessary - %R < 60%, J(+)/UJ(-) or %R > 140%, J(+) only.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.			✓						✓			

Action:

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

Note: CRDL
As 138%/—
Se 132%/122%
Tl 62%/—

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:

Post-digestion Spike — 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:

11.0 Field Duplicate Samples

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

Note:

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 2												
12.1.2	Number of target compounds in each analysis: 22												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

DATA VALIDATION WORKSHEET - 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.: SAI38A

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

⊛ COC 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: 8/6/02 0809 (MSA5973) I. Cal.
8/9/02 0856 QC, Samples

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

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

Note: TCLP Blank - 0805T △chloromethane 0.074 mg/L, △methylene chloride 0.023 mg/L
1.1-Dichloroethane 0.065 mg/L, chloroform 0.0039 mg/L
1.1.1-Trichloroethane 0.0029 mg/L, △Benzene 0.0053 mg/L
△1.2-dichloroethane 0.0081 mg/L, ~~1.2-Dichloroethane~~ TA
1.2-dichloropropane 0.0061 mg/L, Bromodichloromethane 0.0034 mg/L
trans-1.3-dichloropropane 0.0029 mg/L, 1.1.2-Trichloroethane 0.0068 mg/L
1.1.2.2-Tetrachloroethane 0.0079 mg/L, Xylene 0.0043 mg/L
Method Blank - methylene chloride 0.026 mg/L.

5.0 GC/MS Initial Calibration

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

Note: I. Cal 8/5-6/02 chloroethane r^2=0.9878, 2-Hexanone r^2=0.9878
1,1,2,2-Tetrachloroethane r^2=0.9890
All other %RSDs or r^2 were in control. SPCC/CCC OK, 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 8/9/02 0951 chloromethane -26.0%, acetone -35.4%,
2-butanone -32.2%, 4-methyl-2-pentanone -23.5%
2-Hexanone -25.3%, Bromoform -29.5%.

- chloromethane → U.2.
Results for these compounds were either non-detect or qualified as non-detects, JL

7.0 Surrogate Recovery

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

① 2-butanone was not detected in the associated samples.
② all MS/MSD %Rs were OK.
no data qualifying action was 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

		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:

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
chloromethane	0.070	0.070	—	0.02
CS2	0.0086	0.020U	0.0086	0.02

14.0 Data Completeness

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

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 33

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

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

% Completeness = 100%

Note:

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

Reviewer: JA
Date:
Lab: STL Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAI38A

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

1) COCs were not provided (wrong COC in SVOC fraction, see COC in pesticide)
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(-).		[✓]	

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
	TCLP	SVOC			
7/26/02	7/31-8/1	8/1/02	5/0	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) QC, field samples
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-FB ANNDs

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 5973)

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:

8/15/02 0883. All %Ds <20% All RRF >0.05
8/16/02 1030 surrogate 2,4,6-Tribromophenol 25.8% 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-T (DF=5) base/~~neutral~~ neutral (*) Nitrobenzene-d5 / 2-Fluorobiphenyl J/UJ 0%

WASTE-Q-1-COMP-TDL DF=10 All base/neutral and 2 acid 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 - WASTE-Q-10-COMP-T All %Rs and RPDs were in control

(*) only spike TCLP compounds, not full list of TCL

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.
(only TCLP list)

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.	[✓] (JA)	✓	

Note: WASTE-Q-9-COMP-T WASTE-Q-9-COMP-T Dup.

DF ~~5~~ 1 1

(JA) see next page.

14.0 Data Completeness

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

14.1.1 Number of samples: 4

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 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.: SAI38A

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

① 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 Pesticide			
			8/10/02	9 days
7/26/02	7/31-8/1	8/1/02 5/0		

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:

Fluid blank - 08010-IFB All NDs

Method blank - 08010-IMB All NDs.

4.0 Initial Calibration

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

Note: I. Cal 8/8-9/02 All %RSDs or r^2 were in control on both columns

5.0 GC/ECD Instrument Performance Check

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

Note: 8/8/02 1906) All %Bs 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 -28.9%
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?	[ ]	✓	
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: 08010-1MB DCBP —/26%. ↓ (30-150%)
08010-1MBLCS DCBP 22%/18% ↓
WASTE-Q-1-COMP-T TCMX —/16%, DCBP 27%/11% All NDs 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 – WASTE-Q-10-COMP-T All %Rs and RPDs were in control

only spiking TCLP compounds

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-08100-IMB All %Rs were in control.

only spiking TCLP compounds

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 NDs in field samples.

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-9-COMP-T WASTE-Q-9-COMP-T-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:
WASTE-Q-1-COMP-T (RTX-CLP2) Bromonitrobenzene 264557 ↑ (346.1%) 38216-114646
All NDs in 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: 21

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

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

% Completeness = 100%

Note:

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

Reviewer: JA
Date:
Lab: STL Savannah

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

(*) 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(-).		✓	

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
	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

		Yes	No	NA
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

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.: SAI38A

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	Herbicides			
7/26/02	7/31-8/1	8/2/02	5/1	8/8/02	6 days
				9/5/02	34 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: Fluid Blank - 0802N-SFB All NDs.
Method Blank - 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 SGSECD 8/4-5/02 All %RSDs or r^2 were in control on both columns.
8/9/02 All %RSDs or r^2 were in control on both columns.
9/4-5/02 All %RSDs or r^2 were in control on both columns.

5.0 Continuing Calibration 8/16/02 1107 Dalapon 17.0%/—, Dicamba 20.2%/—, MCPP 26.3%/—, MCPA 17.1%/—, 2,4-D 16.4%/20.3%, PCP 23.7%/—, 2,4,5-TP 16.2%/19.1%, 245T 17.8%/—, 24-DB —/17.8%

		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%)? 8/17/02 0039 Dalapon —/-15.5%. If yes, J(+)/UJ(-) ~~9/5/02 0234 2,4-D —/17.8% → J(+).~~	✓	[ ]	
5.4	verification.		[ ]	✓

Note: 8/7/02 2324 Dalapon 20.9%/20.4%, UJ MCPP 24.4%/—, MCPA 21.9%/31.3% UJ
45366A-5 8/8/02 1037 Dalapon 22.3%/17.6%, MCPP 18.6%/—, MCPA —/19.3%.
-7 8/8/02 2018 Dalapon 20.5%/19.1%, MCPP 23.1%/—, MCPA 18.4%/24.4%
-8 9/5/02 0234 2,4-D —/17.8%. → J.C. in 45366D-5DL.
8/13/02 1601 MCPP 17.1%/—, 2,4-DB 18.2%/20.7%, Dinoseb —/15.7%.

6.0 Surrogate Recovery

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

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

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

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

Note: WASTE-Q-1-COMP-T 2,4-DCAA —/0% J/R.
WASTE-Q-1-COMP-T DL 2,4-DCAA 0%/0% DF=10, or diluted out.

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
⊗ only spiking TCLP compounds

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

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

Note: LCS - 08UZN-SMB All %Rs were in control.
⊗ only spiking TCLP compounds.

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:

PCP conc in WASTE-Q-1-COMP-T DL (DF=10) exceeded the linear range. J, f

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:

	W-Q-9-COMP-T	W-Q-9-COMP-T-Dup.	Difference	RL
2,4-D	0.025 U	0.028	0.028	0.025
PCP	0.010	0.082	(0.072)	0.025
			> 2XRL	
				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: 5

12.1.2 Number of target compounds in each analysis: 11

12.1.3 Number of results rejected and/or not reported: 7

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

% Completeness = 87.3%.

Note: _____

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

SDG No.: SAI38A
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

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	TCLP Extraction	H.T	Analysis	H.T.
Lep	7/26/02	8/2/02	12 days	8/9/02	2 days
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:

CRDL

As — / 123%

Na — / 76%

Tl 67% / —

5.0 Blanks

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

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

Note:

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: Lab dup. WASTE-Q-10-COMP-T.

Iron RPD = 34.3%. ~~J,(+).~~ ~~J,K.~~ (JA)

associated results were either NDs or flagged as ND, 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.)		✓					✓					
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 - WASTE-Q-10-COMP-TS

Cu MS = 45%, MSD = 45% J/UJ

(JA) ~~Na~~ Pb MS = 1328% MSD = 1329% J(+)

Zn MS = -29%, MSD = -29% J/UJ

(JA) Post-digestion spike All %Rs were in control. (WASTE-Q-1-COMP-T)

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.

see attached.

Pb difference > 2xRL, the Pb ~~this~~ results in associated samples were previously flagged due to matrix spike failure! [illegible]

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: 7/22/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII02

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:

Collected	analyzed
6/10/02	6/20/02
6/11/02	6/20/02, 6/21/02

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 at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: all ND ✓

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?	[ ]	✓	
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: IC 6/12/02 acetone RRF 0.0468
all ND, R,C in all samples.

acetone RRF = 0.0533 + 0.0497 + 0.0457 + 0.0392 + 0.0448 / 5 = 0.0466 ✓ calc. attached

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) between initial and continuing calibration RRF outside QC limits (%D < 20%)? 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: CC 6/20/02 acetone RRF 0.039
CC 6/21/02 " " 0.040 prev. flagged - no more action.

$\%D = \frac{RFV - RRF}{RRF} \times 100$

Chloromethane: $\frac{.54482 - .61441}{.61441} \times 100 = -4.8\%$ OK ✓

acetone: $\frac{.03905 - .04677}{\ldots} \times 100 = -16.5\%$ OK ✓

7.0 Surrogate Recovery

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

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

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

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

Note: %R = amt found / amt add : DBFB in 44032-1 = 61/50 x100 = 122%.

toluene in 44032-2 = 57/50 x100 = 114% ✓

BFB in 44056-4 = 53/50 x100 = 106% ✓

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 = found/added x100 = 58/50 x100 = 116%.

" MSD " = 56/50 x100 = 112%.

%RPD = S-D / SPD/2 = 3.5% ✓ 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: Chloromethane 48/50 x100 = 96%
acetone 88/100 x100 = 88% ✓

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:

IS1 Sample 44032-1
273614 / 326883 = 0.837 x100 = 83% ✓

IS3 Sample 44056-3
330076 / 301117 x100 = 109% ✓

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 44032-1

0.22 1,1-DCE = $\frac{A_s \times C_{is}}{A_{is} \times RF}$ = $\frac{659 \times 250}{273614 \times .54395}$ = 1.1 / 5 = 0.22 ✓

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: 44056-4

benzene = $\frac{16326 \times 250}{589781 \times 1.24235}$ = 5.5 / 5 = 1.1 ✓

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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: 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 = 96%

Note:

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

Reviewer: RA
Date: 7/23/02
Lab: STL, Savannah

Project Name: Sarget
Project Number:
SDG No.: SAI102

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
6/10/02	6/12/02	6/28/02
6/11/02	6/17/02	6/22/02, 6/25/02

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: NO ✓

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?	[ ]	✓	
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	verification.		[✓]	

Note:

See attached calculations—

IC 6/18/02

2,4-dinitrophenol %RSD 44.2%

4,6-dinitro-2-methylphenol 39.7% No pos. result, no 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.	✓	[ ]	
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 6/23/02 2,4-dinitrophenol 24.7

CCC 6/22/02 2,6-dinitrotoluene 20.5

2,4-dinitrophenol 33.5 No pos.,

4-nitrophenol 24.1

2,4-dinitrotoluene 26.9 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: Sample GW-WAA-3-44 ft true BNA = 50 ug/L, acid = 100 ug/L
2-fluorophenol = $\frac{\text{found}}{\text{true}} = \frac{68}{100} \times 100 = 68\%$ ✓
phenol-d5 = $\frac{73}{100} \times 100 = 73\%$ ✓ 2,4,6-Tribromophenol = $\frac{100}{100} \times 100 = 100$ ✓
nitrobenzene-d5 = $\frac{35}{50} \times 100 = 70\%$ ✓
2-fluorobiphenyl = $\frac{34}{50} \times 100 = 68\%$ ✓ terphenyl-d14 = $\frac{22}{50} \times 100 = 44\%$ ✓

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

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

Note:
LCS/LCSD were provided.

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

Phenol %R = 79/100 x 100 = 79% ✓ LCS
2-Methylphenol %R = 86/100 x 100 = 86% ✓ LCS
Phenol %RPD = 79 - 71/(79+71)/2 x 100 = 10.6 = 11% ✓
2-Methylphenol %RPD = 13.6% ~ 14% ✓

Phenol %R = 71/100 x 100 = 71% LCSD
2-Methylphenol %R = 75/100 x 100 = 75% LCSD

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:

Perylene-d12 > QC for 44056-3 → 138929/133002 x 100 = 104%
no pos. → no flag

Sample was re-analyzed, however, all IS > QC for the re-analyses -
original sample result should be used -

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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: OK ✓

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

Reviewer: RA
Date: 7/23/02
Lab: STL Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII02

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	
6/11/02	6/14/02	6/18/02	Pest.
6/11/02	6/14/02	6/20/02	PCB

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(-)			
	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 6/19/02 endrin aldehyde -24.2 / -19, UJ, C in sample
4 back column only 4,4-DDD 20.3, 4,4-DDT 19.3, no action required

4,4-DDD %D → $\frac{\text{CCLRRF} - \text{ICal RRF}}{\text{ICal RRF}} \times 100 = \frac{.67999 - .56536}{.56536} \times 100 = 20.3\%$ ✓

endrin aldehyde %D = $\frac{.50266 - .62036}{.62036} \times 100 = -18.9\% \sim -19\%$ ✓

7.0 Surrogate Recovery

monochlorobiphenyl %D = $\frac{\text{CCAL RRF} - \text{Ical RRF}}{\text{ICal RRF}} = \frac{1.46686 - 1.52227}{1.52227} \times 100 = -3.6\%$ ✓

		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: NO MS/MSD was provided.

LCS/LCSD was provided and were good.

9.0 Laboratory Control Sample (LCS)

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

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

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

Note: Dichlorobiphenyl LCS%R = $\frac{1.3}{2}$ x100 = 65% %RPD = 0% OK✓

" " LCSD %R = $\frac{1.3}{2}$ x100 = 65%

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil will be used.	[ ]		

Note: _____

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: _____

13.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

Note: _____

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

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sanger Area II
Project Number:
SDG No.: SAII02

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 2-7°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(-).		[✓]	
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.
6/11/02	6/14/02	3 days	6/20/02	6 days

3.0 GC/MS Instrument Performance Check (IPC)

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

Note:

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 - 0614 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 680 the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I. Cal. 6/20/02 All %RSDs < 15%.
(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. 6/20/02 1753. All %Ds < 20%

Monochlorobiphenyl C. Cal RRF = 1.46686 / N

$\frac{119191 \times 0.75}{60942 \times 1.00} = 1.466858$

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: $^{13}C_{12}$ - ~~Dist~~ Decachlorobiphenyl - spiking conc. 2.5
GW-UAA-3-24Ft 80% R reported. 2.02/2.5 = 80.8%
MB-004C-KMB 72% R reported 1.8/2.5 = 72%

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note: LCS/LCSD - 06140-KMB All %Rs and RPDs were in control.

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note: All RDs in associated samples

12.0 TCL Quantitation and Reported Detection limits

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

Note: typo "Monochlorobiphenyl" on all summary forms - check with lab and waiting for resubmittal.

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: 1

14.1.2 Number of target compounds in each analysis: 10

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

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

% Completeness = 100%

Note:

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

Reviewer: RA
Date: 7/22/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SAII02

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
6/11/02	6/18/02	6/20/02

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:

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: Due to insufficient sample vol. MS/MSD not performed. 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: %RPD > QC limit (PA (44), Pentachlorophenol (50), 2,4-DB (61%). No pos. result, no action ✓
Dalapon %R → 3.1/4 x100 = 78% ✓
2,4-DB LCSD%R = 2.4/4 x100 = 60% ✓

9.0 TCL Identification

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

Note:

10.0 TCL Quantitation and Reported Detection limits

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

Note: all ND ✓

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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

Conventional Analysis

Reviewer: RA
Date: 7/25/02
DV Level: II (III) IV
Review Document:
___ NFG/SW-846
___ NJDEP/SW-846
✓ NFG/CLP
___ Project QAPP/SAP
___ Region III/SW-846

Project Name: Sarget Area II
Project Number:
Laboratory: STL
SDG No.: SA2102
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:

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: 6/11/02 analyzed 6/19/02

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: MS%R = $\frac{140-94}{93} \times 100 = 49\%$ ✓ MS/MSD LQC 49/39 no action ✓

MSD = $\frac{130-94}{93} \times 100 = 38.7 = 39\%$ ✓

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 %R = 71/93 x 100 = 76%

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, contact your PM for guidance.			/
8.3	Were there any transcription /calculation errors noted in the duplicate data?			/

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
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAII02
Lab: STL Savannah

Project Name: Sauget Area II
Reviewer: RA
Date: 7/24/02

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
6/11/02 6/27/02 ICP
" 6/18/02 CV

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

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

Note: CRDL %R < QC limit 80-120% for iron (70%/74%), Se 52%. No action specified in guidelines.

%R for Al = $\frac{\text{found}}{\text{true}} \times 100 = \frac{239.1}{200} \times 100 = 120\%$ ✓ %R lead = $\frac{5.621}{5} \times 100 = 112.5 = 113\%$ ✓

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	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		✓						✓				

Note: MB → al 0.0371, calcium 0.0129, Hg −0.000074 mg/L → ND → UJ, P
K <5x → U, P → 75x, no action
ICB → Al 34.1 → prev. flagged, Thallium −5.12 → <5x → J, O
CCB → Silver −0.770 → ND = UJ, O, Thallium 6.75 prev. flagged –

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: al %R = Final Found Sol AB / True Sol. AB = 505200 / 501250 x100 = 100.9% = 101%.

Cobalt %R = 482.5 / 502 x100 = 96%. ✓

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: antimony LCS %R = Found / True x100 = 2.084/2 x100 = 104%. ✓
barium " = " = 2.222/2 x100 = 111%. ✓
Mn " " " " = 0.5428/0.5 x100 = 108.6% = 109%. ✓

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: cal %RPD = $\frac{(34.55-34.81)}{\frac{(34.55+34.81)}{2}} \times 100 = 0.7\%$ ✓

Sodium %RPD = $\frac{(23.23-23.03)}{\frac{(23.23+23.03)}{2}} \times 100 = 0.86\% = 0.9\%$ ✓

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: %R = $\frac{SSR - SR}{SA}$. Al → $\frac{2.201 - .08228}{2} \times 100 = 105.9\% = 106\%$ ✓

Be = $\frac{0.05208 - 0}{0.05} \times 100 = 104\%$ ✓ Zinc = $\frac{0.5157 - .005452}{.5} \times 100 = 102\%$ ✓

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: %D = $\frac{|I - S|}{I} \times 100$ Potassium %D = $\frac{|8892 - 9110|}{8892} \times 100 = 2.45\% \sim 2.5\%$

Fe = $\frac{1993 - 1920}{1993} \times 100 = 3.66\% = 3.7\%$ ✓

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 field duplicate results within control? (For aqueous sample, RPD values < 30% or difference < ± 2 x RL and For solids, RPD < 50% or difference < ± 4 x RL)												

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: 7/25/02
DV Level: II (III) IV
Review Document:

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

various tests

Project Name: Sarget Area II
Project Number:
Laboratory: STL Savannah
SDG No.: SAII02
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:

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	
6/11/02	6/13/02	NO3, CO2
"	6/18/02	alkalinity
"	6/20/02	SO4

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: SO4 CCV = 20.753/20 x100 = 104% ✓
ICV ferrous iron = 1.887/2 = 94% ✓

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: % RPD ferrous iron = $\frac{87\% - 87\%}{\frac{(87+87)}{2}}$ = 0% ✓

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

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

Notes: nitrate LCS = $\frac{0.454}{0.5}$ = 90% ✓

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: Sulfate MS 115% RPD = 0.8% ✓
MSD 114%

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, contact your PM for guidance.	✓		/
8.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

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: Middlebrooks
Date: 7/25/02
Lab: STL- Savannah

Project Name: Sauget Area II
Project Number: 23-20010024.02
SDG No.: SA1103

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°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 - 6/12/02, 6/13/02
Date Prepped -
Date Analyzed - 6/20/02, 6/21/02 8 days, 7 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 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 at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]	✓	
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: _____

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?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: ICAL - 6/12
RRF acetone 0.04668

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) between initial and continuing calibration RRF outside QC limits (%D < 20%)? 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 6/20 @ 0951
RRF acetone 0.03905

CCV 6/21 @ 1019
RRF acetone 0.0406

7.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[ ]	✓	
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]		✓
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[ ]		✓
	For sample results > 5 x CRDL (or the RL), a control limit of 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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 = 288/297 = 97.0%

Note:

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

Reviewer: MSShadle
Date: July 25, 2002
Lab: STL - Savannah

Project Name: Sanger Area 2
Project Number: 23-20010024.02
SDG No.: SA1103

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

Note:

~~Cooler Temp.~~
Date Sampled - 6/12, 6/13
Date Prepped - 6/17/02, 6/18/02 5 days, 4 days, 6 days
Date Analyzed - 6/22/02, 6/23/02, 7/5/02, 6/28/02

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:

Method Blank - 4/28/02
benzo(k) fluoranthene 1.0 ug/L
indeno(1,2,3-cd) pyrene 0.92 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 over the concentration range of the calibration applying either %RSD <15% or R >0.995?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) — J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

ICAL - 6/21/02
4,6-dinitro-2-methylphenol - 0.990 - okay
ICAL 6/27/02
2,6-dinitrotoluene 0.992 - okay
2,4-dinitrotoluene 0.989 UJ/J
4,6-dinitro-2-methylphenol - 0.993 okay

ICAL - 6/28
2,6-dinitrotoluene 0.989 J/UJ
2,4-dinitrophenol 44.3% J/UJ
2,4-dinitrotoluene 0.990 okay
4,6-dinitro-2-methylphenol 39.7% J/UJ
pentachlorophenol 0.993 - okay

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.	✓	[ ]	
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 6/22 @ 1217
2,6-dinitrotoluene 20.5%
2,4-dinitrophenol 33.5%
4-nitrophenol 24.1%
2,4-dinitrotoluene 26.9%
CCV 6/23 @ 1136
2,4-dinitrophenol 24.7%

CCV 6/28/02 @ 0003
dinoseb -22.8%
CCV 6/29/02 @ 1025
dinoseb -38.3%
CCV 7/5/02 @ 0944
2,4-dinitrophenol 88.7% J/UJ
4-nitrophenol 24.7% J/
4,6-dinitro-2-methyl phenol - 52.8% J/UJ
Hexachlorobenzene -24.1%

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

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

Note:
44100-4DL - nitrobenzene 0%, 2-fluorobiphenyl 0%, terphenyl-d14 - 0%
44100-5DL - all surrogates 0%
44159-1DL " " "
44159-2DL nitrobenzene 0%, 2-fluorobiphenyl 0%, terphenyl-d14 - 0%
44159-4DL all surrogates 0%

all dilution dil. > 10x 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.

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

	Area > 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: 06176-JMBLCS-phenanthrene-210 (220933/109382) - QC sample

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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: 67

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 = 468 / 469 = 99.8%

Note:

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

Reviewer: M Michaelle
Date: July 25, 2002
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number: 23-20010024.02
SDG No.: SA1103

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 - 4°C for all coolers

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 - 6/12/02, 6/13/02
Date Prepped - 6/14/02, 6/18/02 2days, 6days, 1day, 5days
Date Analyzed - 6/18/02, 6/26/02, 6/28/02, 6/19/02 4days, 12days, 14days, 5days, Ø days, 10days, 1day

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(-)			
	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 - 6/19/02 @ 0216 front		CCV - 6/19/02 @ 1750 (rear)		CCV - 6/26/02 @ 0518 (front)	
endrin aldehyde -	-24.2%	2,4-DCAA	-17.7%	endosulfan II	21.1%
2,4-DCAA -	-23.2%	CCV - 6/20/02 @ 0802 (rear)		endrin ketone	16.8%
	rear	2,4-DCAA	-16.9%	2,4-DCAA	-16.0%
4,4'-DDD	20.3%	CCV - 6/25/02 @ 2305 (front)		DCBP	39%
4,4'-DDT	19.3%	2,4-DCAA	-17.1%		(rear)
endrin aldehyde	-19.0%		(rear)	heptachlor epoxide	-26.5%
2,4-DCAA	-22.8%	2,4-DCAA	-19.8%	endrin aldehyde	-19.8%
				endrin ketone	96.7%
				2,4-DCAA	-18.6%

7.0 Surrogate Recovery

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

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

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

Note:

44100-1 TCX 1 = 28% ↓ - okay

44159-1 DCB 1 = 26% ↓, DCB2 = 24% ↓ - okay

44159-2 DCAA 1 = 24% ↓, DCAA2 = 28% ↓, DCB1 = 17% ↓, DCB2 = 14% ↓ J, UJ

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

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

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note: (6/26)
LCSDup: delta-BHC 44%↓, endrin (34%) → LCS
alpha-chlordane (20%)

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: 44159-1 - gamma-BHC 101.9% J 44159-2 - beta-BHC 168.9% J
heptachlor 127% J

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil will be used.	[ ]		✓

Note: _____

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: _____

13.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

Note: _____

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

Reviewer: Mushadle
Date: Aug 6, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 03

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	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 - 6/12/02, 6/13/02
Date Prepped - 6/18/02 5 days, 6 days
Date Analyzed 6/21/02 3 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for 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 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

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

Note:

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

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

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

	Area > 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: Muldhadle
Date: July 25, 2002
Lab: SR - Savannah

Project Name: Sauget Area II
Project Number: 23-20010024.02
SDG No.: SA1103

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°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 Sampled - 6/12/02, 6/13/02
Date Prepped - 6/18/02 6 days, 5 days
Date Analyzed - 6/20/02 2 days

3.0 Blanks (Method Blanks and Field Blanks)

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

Note:

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

Note: CCV - 6/20/02 @ 1117 (rear) CCV - 6/20/02 @ 2016 (rear)
2,4-DB 26.7% dicamba -18.3%
2,4-DB 16.0%

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:

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: MCPA - (44%)
Pentachlorophenol - (50%) } LCS + LCS dup %Rs okay. No action taken
2,4-DB (61%)

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: 44159-1 2,4-D 69.4% RPD J 44159-2 2,4,5-TP 79.7% J
2,4,5-TP 109.7% J
2,4-DB 107.7% J

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]	✓	
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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: MiSshadle
Date: July 25, 2002

SDG No.: SA1103
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 - 4°C

2.0 Holding Time

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

Note: Date Sampled - 6/12/02, 6/13/02
Date Prepped - 6/20/02 7 days, 8 days
Date Analyzed - 6/26/02 6 days

3.0 Method Detection Limits (MDL)

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

Note:

4.0 Instrument Calibration

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	✓						✓					
4.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).							✓					
4.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.		✓						✓				
4.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	✓						✓					
4.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).	✓						✓					
	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.												
4.9	Were any transcription/calculation errors noted in the calibration data? Level IV only.		✓						✓				

Note: Arsenic 79% Lead 129%
Iron 127%
Sample calculation

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	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		✓						✓				

Note: ICB- Ag -1.01 CCB1 As -3.28 CCB2 Al 9.69 CCB3 Al 9.8 Cu 1.03
Prep Ag -0.0018 Ag -0.95 Be 0.304 Ba 0.987 Mgn 1.14
V 1.43 Mg 9.75 Be -0.260 Se 8.2
Ag 1.14 Ca 27.4 V 1.02

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:

Fe 36% } Post digestion spike 80%
Fe 25% }

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:

Cu - 53% } <50x MDL
Zn - 60.8% }

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 field duplicate results within control? (For aqueous sample, RPD values < 30% or difference < ± 2 x RL and For solids, RPD < 50% or difference < ± 4 x RL)			✓						✓			

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: [illegible]
Date: August 6, 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: Sangat Area 2
Project Number: 89-F2001002-4.02
Laboratory: STL - Savannah
SDG No.: SAII03
Test Name: Dissolved Gases
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:

Date Sampled - 6/5/02, 6/13/02
Date Prepped - 6/13/02 1 day
Date Analyzed - 6/21/02 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 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: r^2 = 0.986

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, for %R > UCL, K(+) only; for %R < LCL, L(+)/UL(-), for %R < 30%, L(+)/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:

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, L(+)/UL(-).		✓	
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, contact your PM for guidance.			✓
9.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

10.0 Sample Results/Detection Limit Verification

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

Notes:

11.0 Data Completeness

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

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Alkalinity, Ferrous Iron, NO_3^- / NO_2^-
SO_4^{-2}, CO_2

Reviewer: MSShadle
Date: July 25, 2002
DV Level: II (III) IV

Project Name: Sauget Area 2
Project Number: 23-20010024.02
Laboratory: STL - Savannah
SDG No.: SA1103
Test Name: Wet Chemistry
Method No.:

Review Document:

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

1.0 General: Chain-of-Custody/Data Deliverables

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

Notes:
Cooler Temp - 4°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:

Alk	Fe^{+2}	NO_3^-	SO_4^{-2}	CO_2^-
6/12, 6/13	6/12, 6/13	6/12, 6/13	6/12, 6/13	
6/18	6/13, 6/14	6/14/02	6/20	

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: Fe^{+2}

MS/MSD - okay

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, contact your PM for guidance.			✓
8.3	Were there any transcription /calculation errors noted in the duplicate data?			↓

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
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 8/7/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SAII05

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?		✓	

Note:

2.0 Holding Time/ Preservation

		Yes	No	NA
2.1	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, based on professional judgement the reviewer may flag positive results with a "J" and non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? 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			
	For method 5035 prepared soil samples, reference the preservation and holding time requirements of the published method.			
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		✓	

Note:

collected	analyzed
6/14/02	6/26/02
6/17/02	6/26/02

3.0 GC/MS Instrument Performance Check

		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 no, applying professional judgement, the reviewer may flag R.			
3.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag 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 batch?	✓		
4.2	Do any method blanks have positive VOA results (TCL and/or TIC)?		✓	
4.3	Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?			
4.4	Are there field/trip/rinse/equipment blanks associated with every sample?	✓		
	Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride, acetone, and 2-butanone) the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
4.5	If Level IV, review raw data and verify all detections for blanks were reported.			

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 applying either %RSD <15% or r >0.990?			
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detect "R".			
5.3	Do any compounds have an RRF < 0.05 (use 0.1 for poor responders like acetone and 2-butanone)? If yes, J(+)/R(-).	✓		
5.4	Is the lowest standard at the same concentration as the RL reported? If not, elevate RL.			
5.5	If Level IV, calculate a RRF and a %RSD to verify correct calculations are being made.			

Note: IC 6/12/02 acetone RRF 0.0448 all ND → R, C

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?			
6.2	Has a continuing calibration standard been analyzed for every 12 hours?			
6.3	Do any compounds have a % difference (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	✓		
	If yes, a marginal increase (i.e., <50%) in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R(-); J(+).			
6.4	Do any compounds have an RRF < 0.05 (use 0.1 for poor responders like acetone and 2-butanone)? If yes, J(+)/R(-).	✓		
6.5	If Level IV, calculate a compounds RF and %D from ave RF to verify correctcalculations.			

Note: CC 6/26/02
acetone RRF 0.0404 prev. flagged "R".
bromomethane -28.7, neg. bias ~~UJ/R~~ no pos. <50% → no flag

7.0 Surrogate Recovery/ SMC (System Monitoring Compounds)

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			
7.2	Are surrogate recoveries within acceptance criteria provided by the laboratory for all samples?			
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 acceptance criteria in samples chosen for the MS/MSD or diluted

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

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate

		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 of one matrix spike per ten samples and a duplicate per twenty for each matrix?			
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria specified in the QAPP?		✓	
	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: several MS, RPD > QC limit. see attached. all ND, no action ✓

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?			
9.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?			
9.3	Are all LCS %Rs within acceptance criteria provided by the laboratory?			
	Action for specific compound outside the acceptance criteria: %R>UCL, J(+) only; %R<LCL, J(+)/R(-).			

Note:

10. Internal Standards

					Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits?				✓		
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?				✓		
	Action: For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for non-detects of that sample fraction.						

Note:

11.0 TCL Identification (Only for Level IV Review)

		Yes	No	NA
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?			
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 30%?			

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?			
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?			
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".			✓
12.5	If Level IV, calculate a few positive results using the curve RF to verify correct calculations			

Note: DLs raised due to dilutions.

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?			/
13.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?			
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a qualitative assessment in the data validation report.			

Note:

14.0 Data Completeness

		Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample, 90% for soil sample)		✓	
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 not reported: 9			
	% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)			
	% Completeness = 90%			

Note:

DATA VALIDATION WORKSHEET
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 8/7/02
Lab: STL

Project Name: SAUGET
Project Number:
SDG No.: SAII05

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?		✓	

Note:

2.0 Preservation/ Holding Time

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: Positive sample results <5X (or 10X for common volatile lab contaminants) the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached		✓	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Note:

collect.	extract.	analyzed
6/14/02	6/18/02	7/2/02
6/17/02	6/19/02	7/2/02 > 7/13/16/02

3.0 GC/MS Instrument Performance Check

		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 no, 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 no, applying professional judgement standards, blanks, field samples and QC samples may be rejected "R".			

Note:

4.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?	✓		
4.2	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?		✓	
4.3	Do any field equipment blanks have positive results (TCL, and/or TIC)?			✓
	Action: Positive sample results <5X (or 10X for common lab contaminants) the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
4.4	If Level IV, review raw data and verify all detections for blanks were reported.			

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 applying either %RSD <15 or R >0.99? ~~If no, J(+)/UJ(-)~~ if <50% → J+only		✓	
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-). if >50% → J/UJ		✓	
5.4	If Level IV, verify a RRF and a %RSD calculation.			

Note: IC 6/30/02
benzo(k) fluoranthene % RSD 15.212% No pos. to flag ✓

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	✓		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis?	✓		
6.3	Do any compounds have a % difference (%D) between initial and continuing calibration RRF > 20%?	✓		
	If yes, a marginal increase (i.e., <50%) in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R(-); J(+).			
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/ R(-).		✓	
6.5	If Level IV, verify a %D calculation.			

Note: CC 7/2/02 4-nitrophenol 31.4%, benzo(k)fluoranthene (25.9) pos. Bias all ND, no flags

CC 7/16/02 See attached
only pentachlorophenol negative bias -20.3 → UJ/C in GW-UAA-1-80FT

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 provided by the laboratory for all samples and method blanks?	✓		
7.3	Are more than one of either fraction outside the acceptance criteria?			
7.4	If Yes in Section 7.3, are these sample(s) or method blank(s) reanalyzed?			
7.5	If Yes in Section 7.3, is any sample dilution factor greater than 10?			
	Note: If SMC recoveries display unacceptable recoveries in the MS and/ or diluted samples, then no reanalysis is required and acids and base/ neutrals are assessed separately.			

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

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) of MS and a field sample duplicate

		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 not to exceed twenty field samples for each matrix?			
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria provided in the QAPP?			
	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: No LCS/LCSD were analyzed 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?		✓	
	If no, for individual compounds with %R>UCL, J(+) only; %R<LCL, J(+)/R(-). If more than half of the spike compounds display unacceptable recoveries, use professional judgement to qualify data.			
9.4	If Level IV, verify the % recoveries are calculated correctly.			

Note: LCS/LCSD %R < QC (10-144) for LCS 7/13/02 7/18/02 R, J in ass. Samples
+ 3,3-dichlorobenzidine

%RPD > QC (~~10-130~~ 67) 4-Chloroaniline 72% - no pos. no action

10.0 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	✓		
	Area > +100% / Area < -50% / Area < -10% Positive: J / J / J Non-detect: None / UJ / R	✓		
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	Action: The chromatogram must be examined to determine if any false positives or negatives exist.			

Note:

11.0 TCL/TIC Quantitation and Reported Detection Limits (Level IV Only)

		Yes	No	NA
11.1	Are RLs adjusted to reflect sample dilution(s) and, for soil, sample moisture?	✓		
11.2	Were any compounds reported at levels exceeding the linear range of the instrument? If yes, flag "J"		✓	
11.3	If Level IV, Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?			✓
11.4	If Level IV, are all ions present in the standard spectrum at a relative intensity greater than 10% also present in the sample spectrum; and do sample and standard ion intensities agree within 30%?			✓
11.5	If Level IV, are ions >10% in the reference spectrum present in the sample TIC and agree within 20%?			✓

Note:

12.0 Field Duplicate Samples

		Yes	No	NA
12.1	Were any field duplicates submitted for VOC analysis?			✓
12.2	Were all RPD or absolute difference values within the control limits?			✓
	No action is taken based on field duplicate results.			

Note:

13.0 Data Completeness

		Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample, 90%	✓		
13.1.1	Number of samples: 7			
13.1.2	Number of target compounds in each analysis: 67			
13.1.3	Number of results rejected and not reported: 4			
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)			
	% Completeness = 99% ✓			

Note:

33x2+1=

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

Reviewer: RA
Date: 8/7/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SAII05

Pesticides

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
6/14/02	6/18/02	6/25/02
6/17/02	6/18/02	7/2/02

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: 6/28/02 1136 methoxychlor 16.2, heptachlor 23.2 ND, no action
" 1854 heptachlor 17.1, ND, no flag
7/2/02 1233 " 15.2 " "

7/3/02 0009 4,4-DDE 16.6, 4,4-DDD 21.8, endosulfan II 15.7, endrin ketone 21.5, heptachlor 25.8, ND, 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:

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: several % RPDs > QC. See attached. 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: %D > 40% gamma-BHC (84.7%) in GW UAA-1-60FT → 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: _____

13.0 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: _____

13.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

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.: SAII05

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 2.1°C (COC 027931).

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:

Dates Collected	Dates Extracted	H.T	Date Analyzed	H.T
6/14/02	6/18/02	4 days	6/21/02	3 days
6/17/02	6/18/02	1 day	6/21/02	3 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for 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:

MB-0618E-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 680 the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

I. Cal. 6/20/02 (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:

C. Cal. 6/21/02 0958 All %Ds < 20%.

C. Cal 6/21/02 1703 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.	[ ]		✓
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

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

Note:

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

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

Note:

No MS/MSD specified on the COC

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

LCS/LCSD - All %Rs and RPDs were in control.

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note: All NDs in associated samples

12.0 TCL Quantitation and Reported Detection limits

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

Note: All aqueous samples

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: 2

14.1.2 Number of target compounds in each analysis: _____

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
HERBICIDES ANALYSIS - NFG modified for RCRA

Reviewer: RA
Date: 8/7/02
Lab: STL

Project Name: Sunset Area II
Project Number:
SDG No.: SAF005

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?		✓	

Note:

2.0 Preservation/ Holding Time

		Yes	No	NA
2.1	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, based on professional judgement the reviewer may flag positive results with a "J" and			
2.2	Have any technical holding times, from sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		✓	

Note:

collect	extract	analyzed
4/14/02	6/15/02	7/2/02
4/17/02	6/20/02	6/25/02

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for batch?	✓		
3.2	Do any method/instrument/reagent blanks have positive results?	✓	✓	
3.3	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.			✓
	Action: Positive sample results <5X the highest concentration of any blank should be qualified "U" and the result elevated to the RL for estimate concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			

Note: The MB analyzed 6/25/02 → 2,4-D 0.22 ug/L
<5x → U,7 in GW-UAA-L-60FT 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 five standards included in the calibration curve?	✓		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995)? If not, J(+)/UJ(-).	✓		
4.4	If Level IV, verify a %RSD calculation.			

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 CCC 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 %D > 15%?			
	If yes, a marginal increase (i.e., <50%) in response >15% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R(-); J(+).			
5.4	If Level IV, verify a %D calculation. both columns			

Note: CC 6/25/02 2,4-DB %D 16.7, 20.3 ~~pos. bias ND, no flag~~ ND → UJ, C
CC 7/2/02 ? 19.9, 20.5 neg. bias → UJ/C in GW-UAA-1-20FT

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?.			✓
	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%
Positive	J	J	J
Non-detect	None	UJ	R

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?			/
7.3	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.			

Note: LCS/LCSD was performed-

8.0 Laboratory Control Sample (LCS)

		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?		✓	
	If no, for individual compounds with %R>UCL, J(+) only; %R<LCL, J(+)/R(-). If more than half of the			
8.4	If Level IV, verify the % recoveries are calculated correctly.			

Note: LCS 105% > 10-100% for 2,4,5-TP ND, no flag
several RPD > QC (see attached)
all ND, no action ✓

9.0 TCL Quantitation and Identification (Level IV Only)

		Yes	No	NA
9.1	Are RLs adjusted to reflect sample dilution(s) and, for soil, sample moisture?	✓		
9.2	Does the retention time of each reported compound fall within the RT window? If not, inquire of lab, change			✓
9.3	Is there evidence of unreported peaks? If yes, inquire of laboratory, calculate and add results if necessary.			
9.4	Verify confirmation requirements have been implemented per SW-846 specifications, if not inquire of laboratory;correct results if necessary.			

Note: % RPD > 40% 2,4-D (40.6%) GW-DAA-1-60FT → J,g

10.0 Field Duplicate Samples

		Yes	No	NA
10.1	Were any field duplicates submitted for analysis?			✓
10.2	Were all RPD or absolute difference values within the control limits?			✓
	No action is taken based on field duplicate results alone.			✓

Note: _____

11.0 Data Completeness

		Yes	No	NA
11.1	Is % completeness within the control limits? (95% for aqueous, 90% for soil)	✓		
11.1.1	Number of samples:_____			
11.1.2	Number of target compounds in each analysis:_____			
11.1.3	Number of results rejected and 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: RA
Date: 8/8/02
DV Level: II (III) IV
Review Document:
___ NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ other
✓ NFG/CLP

Project Name: Sauget Area II
Project Number:
Laboratory: STL
SDG No.: SA1105
Test Name: Methane
Method No.: STL SOP AR30

Methane

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
6/14/02	6/21/02
6/17/02	6/27/02

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 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:

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.		√	
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 ?			√
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			√
5.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			√
5.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			√

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?			
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: NO MS/MSD was submitted.

LCS/LCSD results were submitted.

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?		✓	
7.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
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?	✓		
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, contact your PM for guidance.			✓
9.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

10.0 Sample Results/Detection Limit Verification

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

Notes:

11.0 Data Completeness

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

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, ICP-MS, GFAA, and CVAA - for RCRA

SDG No.: SAII05
Lab: STL

Project Name: Sunset Area II
Reviewer: RA
Date: 8/8/02

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			ICP-MS			GFAA			CVAA-Hg		
		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	If samples were not properly preserved, or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated, based on professional judgement the reviewer may flag positive results with a "J" and non-detects "UJ".			✓									✓
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			ICP-MS			GFAA			CVAA-Hg		
		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) Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria), J(+)/R(-).		✓									✓	

Note:

Collect.	analyzed		Collect.	analyzed	
6/14/02	6/25/02	ICP	6/14/02	6/21/02	Hg
6/17/02	6/27/02		6/17/02	7/2/02	Hg

3.0 Quantitation (Level IV Only)

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Verify transcription and calculations for a minimum of one results for each form. Extent the audit and make corrections as necessary if errors are encountered.												
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 results and detection limits?												
3.4	Was MSA used when required by the method? Contact laboratory, correct results or flag J(+);UJ(-)												

Note:

N/A (Level III)

4.0 Instrument Calibration

		ICP			ICP-MS			GFAA			CVAA-Hg		
		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 with one at [CRDL]; CVAA: blank + five standards with one at [CRDL]) If not, applying professional judgement the reviewer may flag J(+); R(-).	✓									✓		
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%

Note: CRDL %R <QC (85-115) Se (72/83), Tl (73), Iron (77) / no action specified. no flags - OK within 60-140%. ✓

5.0 Blanks

		ICP			ICP-MS			GFAA			CVAA-Hg		
		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 batch)?	✓									✓		
5.2	Are there reported PB values > MDL?	✓										✓	
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, make a note in the DV Report.	✓									✓		
5.5	Were continuing calibration blanks (CCB) analyzed after every 10 samples or every 2 hours whichever is more frequent? Action: If no, make a note in the DV Report.	✓									✓		
5.5	Are there reported ICB or CCB values > MDL?	✓									✓		
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, flag 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	If level IV, review all raw data blank results and verify that the results were reported correctly.			✓									✓

Note: MB → Aluminum -0.0769 pos > 5x blank, no action ✓ also As -0.0039, Co -.00075 J/UJ, P also pos. results, Ba, beryllium, calcium, thallium, silver. pos. Be <5x → U,0 in GW-UAA-1-20 FT, GW-UAA-1-60 FT
ICB → Al 10.1, Hg -0.087 ug/L NDs → UJ,0 in both samples.
>5x, no action. ✓ CCBs also neg. for Hg.
CCBs → aluminum -75.6, -74.5 ug/L all 75 x, neg. calcium. 75x. no action ✓
As neg. result, prev. flagged.
CCBs, pos. results for barium, beryllium, Mn, copper, silver, vanadium.
Pos <5x blank U,0 for Be, copper, vanadium in both samples.

6.0 ICP Interference Check Sample (ICS)

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was ICS AB analyzed at beginning of each ICP run (or at least twice every 8 hours)?	✓											
6.2	Are the ICS AB recoveries within 80% - 120%?	✓											
6.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS? Action: < 50% J(+); R(-) 50% - 79% J(+)/UJ(-) > 120% J(+)												
6.5	If Level IV, recalculate one or more of the %R.			✓									

Note:

7.0 Laboratory Control Sample (LCS)

		ICP			ICP-MS			GFAA			CVAA-Hg		
		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 batch)? Action: If no, J(+) any sample not associated with LCS results.	✓											
7.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80-120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV) Action: Solid < LCL J(+)/UJ(-); > UCL J(+); Aqueous < 50% R(+/-); 50% - 79% J(+)/UJ(-); > 120% J(+)	✓											
7.3	If Level IV, recalculate one or more of the %R.			✓									

Note: beryllium 121 %. 7 QC limit. Pos. be results were prev. flagged for MB contamination. no more action required.

8.0 Laboratory Duplicates

		ICP			ICP-MS			GFAA			CVAA-Hg		
		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 batch)? Action: If no, comment in report	✓									✓		
8.2	Was a field blank used for the duplicate analysis? Action: If yes, comment in report		✓									✓	
8.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± PQL for aqueous, and RPD < 35% or difference < ± 2 X PQL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.	✓									✓		
8.4	If Level IV, recalculate the sample and duplicate concentrations and %Ds reported.			✓									✓

Note:

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed one per batch? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓									✓		
9.2	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within 75-125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)		✓								✓		

	%R > 125%	30% < %R < 74%	%R < 30%
Positive	J	J	J
Non-detect	None	UJ	R

Note: Potassium > QC 160/157. J,m in both

10.0 ICP Serial Dilutions

		ICP			ICP-MS			GFAA			CVAA-Hg		
		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(+).		✓										

Note: Aluminum 19.5 > QC Pos J,s in both samples.

11.0 Field Duplicate Samples

		ICP			ICP-MS			GFAA			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?												
11.2	Are all field duplicate results within control? (For aqueous sample, RPD values < 35% or difference < ± 2 x PQL and For solids, RPD < 50% or difference < ± 4 x PQL)												

Note: N/A

12.0 Completeness Calculation

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limits? (95% for aqueous, 90% for soil)	✓						✓					
12.1.1	Number of samples:_____												
12.1.2	Number of target compounds in each analysis:_____												
12.1.3	Number of results rejected and 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

Anion Analysis - NFGs modified for RCRA

Reviewer: RA
Date: Aug. 8/02
DV Level: II (III) IV

Project Name: Sunset Area II
Project Number:
SDG #: SA#05

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?		✓	

Notes:

2.0 Holding Times/ Preservation

		Yes	No	NA
2.1	Does sample preservation, collection and storage meet method requirement?	✓		
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
6/14/02	6/16/18, 20/02
6/17/02	6/18, 19/27/02

It was noted by the lab that due to limited sample volume of preserved sample S2424224 the sample was analyzed from unpreserved and then pH was adjusted to pH<2, the now preserved sample was run for method 353.2. No action required

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve?	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis?	✓		
3.3	Was continuing calibration verification (CCV) analyzed every 10 field samples and at the end of the sequence? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
3.4	Are all calibration standard (ICV +/- 10% and CCV +/- 10%) percent recoveries within the control limits?	✓		
	If no, J(+)/ UJ(-).			

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.		✓	
	Note: use the five times rule to flag "U" at sample result or at the CRQL.			
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

		Yes	No	NA
5.1	Is the matrix spike recovery form present?	✓		
5.2	Was a matrix spike analyzed at required frequency (one per 20 samples) for each matrix?	✓		
5.3	Was a field blank used for MS analysis?		✓	
5.4	No action is taken based on matrix spike results.			✓

Notes:

6.0 Laboratory Control Sample (LCS)

		Yes	No	NA
6.1	Is the LCS recovery form present?	✓		
6.2	Was an LCS analyzed at the required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %Rs outside the laboratory QC limits?		✓	
	< UCL / < LCL			
	Positive: J / J			
	Non-detect: No action / R			

Notes:

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Was laboratory duplicate prepared and analyzed at the corrected frequency (one per 10 samples)?	✓		
7.2	Was a field blank used for duplicate analysis? If yes, note in reviewer narrative.		✓	
7.3	Are all analyte duplicate results within the control limits outlined in the QAPP?	✓		
	No action is taken based on duplicate results.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Was a field duplicate sampled at the corrected frequency (one per 20 samples, per matrix and per level)?			
8.2	Are all analyte duplicate results within the control limits outlined in the QAPP? If no, note it in the reviewer narrative.			

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:

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

Reviewer: MSchaelle
Date: August 8, 2002
Lab: STL- Savannah

Project Name: Sauget Area II
Project Number: SAII 06
SDG No.: 21560888 1001

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 - 4.3°C, 4.9°C, 4.6°C, 4.8°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 Sampled - 6/18/02, 6/19/02
Date Analyzed - 6/27/02, 8 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 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 at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note: _____

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?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	✓	[ ]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note: Acetone - $\overline{RRF}$ = 0.04468
DCAL

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) between initial and continuing calibration RRF outside QC limits (%D < 20%)? 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 - 6/27/02 @ 0941
Acetone - $\overline{RRF}$ 0.03769

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

~~MSD~~ - bromomethane (69%)
chloroethane (38%)
carbon disulfide (24%)
2-butanone (42%)
2-hexanone (40%)
1,1,2,2-TCA (24%)

MSD - 4-methyl-2-pentanone / 180%
2-hexanone / 180%
1,1,2,2-TCA / 142%

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[✓]		
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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: 18

14.1.2 Number of target compounds in each analysis: 33

14.1.3 Number of results rejected and/or not reported: ~~HH~~ ~~HH~~ ~~HH~~ III (18)

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

% Completeness = 576 / 594 = 96.97%

Note:

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

Reviewer: Muddhacle
Date: August 8, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII06

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 - 4.3°C, 4.9°C, 4.6°C, 4.8°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 - 6/18/02, 6/19/02
Date Prepped - 6/21/02 — 2 days, 3 days
Date Analyzed - 7/3/02, 7/4/02 — 12 days, 13 days
7/5/02 — 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 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:

Method Blank. 7/3/02
062113-DMB
di-n-butylphthalate 1.0
bis(2-ethylhexyl) phthalate 9.6

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?	[ ]	✓	
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[✓]	

Note:

benzo(k) fluoranthene 15.2% RSD - close to 15% chang.

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.	✓	[ ]	
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 7/3/02 @ 1432
4-nitrophenol 23.1% - no + detections. No action taken.
CCV 7/5/02 @ 0741
2,4-dinitrophenol 25%
4-nitrophenol 39%
pyrene -23.4%
benzo(k) fluoranthene -25.1%
} no positive detections. No action taken.

7.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

		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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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/PCB ANALYSIS - NFGs Modified for RCRA

Reviewer: Mullhadle
Date: August 8, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII06

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 - 4.3°C, 4.9°C, 4.6°C, 4.5°C

2.0 Holding Time

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

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

Note: Pest:

Date Sampled - 6/18/02 6/19/02 6/18/02, 6/19/02 (W) 6/14/02
Date Prepped - 6/21/02 2 days, 3 days 6/24/02 (W) 8/14/02 5 days, 6 days
Date Analyzed - 6/29/02, 7/2/02 8 days, 11 days 6/27/02, 6/28/02 3 days, 4 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze 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(-)			
	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 6/29/02 @ 1439
front - 2,4-DCAA -21.4%
rear - TMX - -19.3%
CCV 6/30/02 @ 0053
front - 2,4-DCAA -20.2%
rear - heptachlor 16.8%
2,4-DCAA -20.9%
TMX -16.2%

CCV - 7/1/02 @ 1040
front 2,4-DCAA -22%
TMX - -16.6%
rear - heptachlor 20.4%
2,4-DCAA -20.6%
CCV 7/1/02 @ 2200
front - endrin aldehyde -16.5%
2,4-DCAA -22.1%
rear heptachlor 18.2%
2,4-DCAA -18.1%

CCV 7/2/02 @ 1233
front 2,4-DCAA -21.9%
rear - heptachlor 15.2%
2,4-DCAA -18.0%
TMX -15.2%
CCV 7/3/02 @ 0009
front - 4,4'-DDE 16.6%
4,4'-DDD 21.8%
Endosulfan II 15.7%
endrin Ketone 21.5%
DCB,P 16.2%

rear heptachlor 25.8%
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: Pest: 06210-MB TMX#2 - 28%
44262-2 DCB#2 - 28%
-4 TMX#2 - 26% / DCB#2 28%
44312-1 TMX#2 - 28%
44262-3 TMX#2 - 26% / DCB#2 26%

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

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

Note:

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil will be used.	[ ]		✓

Note: 44262-1 (Δ) γ-BHC 182% 44262-2 44262-4 β-BHC 132.7%
α-BHC 121.5% dieldrin 42.4% α-BHC 179.9%
γ-BHC 56.7% 44262-3 β-BHC- 59.6%

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: _____

13.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

Note:

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

Reviewer: MAbhadla
Date: August 14, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII06

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 - 4.3°C, 4.9°C, 4.6°C, 4.8°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 - 6/18/02, 6/19/02
Date Prepped - 6/24/02 5 days, 6 days
Date Analyzed - 6/27/02, 6/28/02 3 days, 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/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 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:

Mono chlorobiphenyl - -18.5%
Dichlorobiphenyl - -18.8%
Tetrachlorobiphenyl - -16.9%
} always

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: August 8, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888 1001
SDG No.: SAII06

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 - 4.3°C, 4.9°C, 4.6°C, 4.8°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 Sampled. 6/18/02, 6/19/02
Date Prepped - 6/20/02 1 day, 2 days
Date Analyzed - 6/25/02 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 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: OG20N-SMB (6/25) - 2,4-D 0.22 ug/L

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

Note: CCV 6/25/02 @ 1711
dinoseb 20% / 15.7% - not used in this grp.
2,4-DB 16.7% / 20.3%

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 (442601-5)
MCPP - 350%/325% ↑ 2,4,5-TP 132%/128% ↑
MCPA - 250%/275% ↑ 2,4-DB 325%/300% ↑ ~~24x spiking amt~~

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: 2,4,5-TP - 105%/105% ↑

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: 44262-2 2,4,5-T 50%

11.0 Field Duplicate Samples

		Yes	No	NA
11.1	Were any field duplicates submitted for analysis?	[ ]	✓	
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)	[ ]		✓
11.3	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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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.: SATI 016
Lab: STL - Savannah

Project Name: Sauget Area II
Reviewer: Mushadle
Date: 8/12/02

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: Cooler Temp - 4.3°C, 4.9°C, 4.6°C, 4.8°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 Sampled - 6/18/02, 6/19/02
Date Prepped -
Date Analyzed -

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: ~~Qa~~

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

Note: Initial Initial Initial
CRDL - Lead 126% - okay CRDL - Thallium 74% - okay Selenium 54% J/UJ
Final Final - Antimony 122%
CRDL - Lead 134% - okay
Thallium 141% - J+

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	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		✓						✓				

Note: CCB2 Be - 0.00021 Ag - -0.00087
CCB3 Be - 0.00024
Prep Blank Be - 0.00027 Tl - -0.0038
CCB4 Al - -0.00916 Be - 0.00032
CCB5 Cd - -0.01037 Be 0.00031 Cu -0.00080
CCB6 Be - 0.00031 Ag - -0.00084

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 spike - Ca - 161% } since
Pb - 141% } spike was okay. No. [illegible]

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 field duplicate results within control? (For aqueous sample, RPD values < 30% or difference < ± 2 x RL and For solids, RPD < 50% or difference < ± 4 x RL)			✓						✓			

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: MSShadle
Date: Aug 12, 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 II
Project Number: 21560888.1001
Laboratory: SR - Savannah
SDG No.: SAII06
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 - 4.3°C, 4.9°C, 4.6°C, 4.8°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 Sampled - 6/18/02, 6/19/02
Date Prepped -
Date Analyzed - 6/27/02 8 days, 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/UJ (6/12)

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, for %R > UCL, K(+) only; for %R < LCL, L(+)/UL(-), for %R < 30%, L(+)/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:

MSD - methane 167% ↓
ethane 172% ↓

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, L(+)/UL(-).		✓	
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, contact your PM for guidance.			✓
9.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

10.0 Sample Results/Detection Limit Verification

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

Notes:

11.0 Data Completeness

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

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

Reviewer: M Shadle
Date: Aug 12, 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: 21560888.1001
Laboratory: STL- Savannah
SDG No.: SAII06
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 - 4.3°C, 4.9°C, 4.6°C, 4.8°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:

	NO_3^-	CO_2	Alk.		SO_4^-		Fe^{+2}
~~Cooler Tem~~ Date Sampled -	6/18/02/6/19/02	6/18, 6/19	6/18, 6/19		6/18, 6/19		6/18, 6/19
Date Prepped							
Date Analyzed -	6/19/02		6/27	8 days	6/27	8 days	6/20/02
	Ø days			9 days		9 days	1 day
							2 days

3.0 Instrument Calibration

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

Notes:

4.0 Blanks (Laboratory and Field)

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

Notes:

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

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

Notes:

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

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

Notes:

7.0 Laboratory Duplicate

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

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		✓	
8.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.			✓
8.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

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:
SDG No.: SAII07

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. 1.0°C – 5.5°C

2.0 Holding Time

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

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

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.
6/20/02	6/27-28/02	7-8 days
6/21/02	6/28/02	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: Instument: MSP5973
5/21/02 0848 I Cal
6/27/02 0933) field samples
6/28/02 0826

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

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		

Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines

4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-1P0627MB chloromethane 0.40 ug/L
(*) S244367-1 S244367-5) All ND. in these samples, ok.
S244367-3 S244367-7
S244367-4 S244367-8
MB-1P0628MB - All NDs. results > 5x blank conc. ok
TB062002-02 All NDs
TB062002 1,1-Dichloroethene 0.36 ug/L - UAA-2-60ft, 70ft, 80ft, 90ft → 20U, 4
TB062102 Trichloroethane 0.61 ug/L. - UAA-2-100ft, 110ft, 120ft → All NDs
TB062102-02 Toluene 0.54 ug/L - AA-0-2-43, 53, 63, 53 Dup. - 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?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 5/21/02 - MSP5973. 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) between initial and continuing calibration RRF outside QC limits (%D < 20%)? 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 6/27/02 1034 Bromomethane -25.2%.

C. Cal 6/28/02 0840. Bromomethane -66.2% → J/UJ, c
1.2-dichloroethane -21.3%
Styrene -23.5%

7.0 Surrogate Recovery

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

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

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

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

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-0-2-23 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 - 1P0627MB.) All %Rs were in control
LCS - 1P0628MB.)

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: S244367-1, S244367-5, and S244367-6 → 10X dilution. S244367-7, S244400-2, and S244400-6 → 20X dilution. S244400-7 - 5X dilution.) RLs were raised ~~for~~ for these samples.

(*) No original analysis were performed.

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil will be used.

Note:

	GW-AA-0-2-53	GW-AA-0-2-53 Dup.
Vinyl chloride	0.51	0.46
1,1-DCA	1.0	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: 18

14.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = 100%

Note: _____

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

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII 07

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. 1.0 – 5.5°C

2.0 Holding Time

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

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

Note:

Date Collected	Date Extracted	H.T	Date Analyzed	H.T.
6/20/02	6/25/02	5 days /	7/5, 22/02	10, 27 days
6/21/02	6/25/02	4 days. /	7/5, 17, 22/02.	10, 22, 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:
6/30/02 1316 — I. Cal 7/13/02 0938
7/2/02 0723 I. Cal. 7/16/02 1300.
7/5/02 0727 7/17/02 1725
7/12/02 1605 — I. Cal. 7/20/02 0819
7/22/02 0634

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-0625B-DMB. All ND's (7/5/02)

MB-0625B-BMB All ND's (7/13/02)

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?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

MSD5973 Instrument

I. Cal 6/30/02 1330-1545 All %RSDs or r^2 were in control.
7/2/02 0852-1130 Dinoseb - %RSD ≤15%
7/12/02 1652-1913 All %RSDs or r^2 were in control.
7/12/02 2009-2230 Dinoseb r^2 = 0.9968, up
7/20/02 0935-1154 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.	✓	[ ]	
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 7/5/02 0741 2,4-Dinitrophenol 25.0%, [4-nitrophenol 39.0%] GW-AA-0-2-23. → JC Pyrene -23.4%
(7/5/02 0808) Benzo(k)fluoranthene -25.1%.
(7/16/02 1323 bis(2-chloroisopropyl)ether 24.0%, 2-nitroaniline 30.3%
QC sample ← (7/16/02 1357) 3-nitroaniline 21.9% 4-nitrophenol 36.1%, 2,4-dinitrotoluene 21.3%
4-nitroaniline 24.3%, Indeno(1,2,3-cd)pyrene 20.8%
7/17/02 1902 2-nitroaniline 30.3%
→ GW-AA-2-120FT-DL
GW-AA-2-110FT.-DL.

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.	[✓]	✓ (7A)	

	> 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-UAA-2-100Ft - Phenol-d5 0%, Nitrobenzene-d5 0%, 2-Fluorobiphenyl 0%.
(DF=5) Terphenyl-d14 0%
(*) 1,4-Dichlorobenzene J,s, others crossed-out, not used for data interpretation
- GW-UAA-2-120Ft. - 2-Fluorophenol 130%, Phenod-d5 140%, Nitrobenzene-d5 144%.
DF=5 2-Fluorobiphenyl 142%
(*) 1,4-Dichlorobenzene J,s, others - No action.
- GW-UAA-2-110ft - surrogates were diluted-out, ok. (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 - GW-AA-0-2-23.
3,3'-dichlorobenzidine MS=0%↓, MSD=0%.↓ (10-144%) "R, m"
N-nitrosodiphenylamine RPD=51% (<25%)
(*) MS/MSD pair were re-analyzed and displayed a 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

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

Note: LCS - 0625B-DMB. 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).

		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:

GW-AA-0-2-23MSDRE 1,4-dichlorobenzene-d4 230912 ↑ (51964 - 2078(8)) 222%
Naphthalene-d8 987915 ↑ (228960 - 915840) 216%

GW-AA-0-2-23 MSRE 1,4-dichlorobenzene-d4 311314 (77795 - 311180) (200.1%)

QC samples, 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 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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil will be used.			

Note:

	GW-AA-0-2-53	GW-AA-0-2-53 Dup.	RL
1,2-dichlorobenzene	2.6 ug/L	2.1 ug/L	10 ug/L
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: 14

14.1.2 Number of target compounds in each analysis: 65

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

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

% Completeness = 98.5%

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.: SAII07

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp. 1.1°C - 5°C

2.0 Holding Time

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

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

Note:

Date Collected	Date Extracted	H.T.	Date Analyzed.	H.T.
6/20/02	6/25/02	5 days	7/3/02	8 days
6/21/02	"	4 days	7/3/02	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 - 0625Q-MMB. All ND

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(-)			
	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. 6/26-27/02 RTX-CLP All %RSDs or r^2 were in control.
RTX-CLP2 ~~Endrin aldehyde +22~~ All %RSDs or r^2 were in control.
(A)

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: 6/26/02 1040
7/3/02 1326
All %Bs for DDT and endrin were in control. /K

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. 7/3/02 1349. RTX-CLP. Methoxychlor −16.3% ; 2,4-DCAA −23.3%
RTX-CLP2 Endrin aldehyde −16.2%, 2,4-DCAA −26.0%, DCBP −17.3%.

7/3/02 2334 RTX-CLP 2,4-DCAA −25.9%.
RTX-CLP2 Endrin aldehyde −16.1%, 2,4-DCAA −30.7%,
TCMX −16.2%, DCBP −17.1%.

7.0 Surrogate Recovery

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

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

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

Note: GW-AA-0-2-13 DCBP – confirmation 26% ↓ (30–150%) – only one out, OK
GW-AA-0-2-53 Dup. DCBP 17%/16% ↓) J/UJ
GW-AA-0-2-53 DCBP 20%/19% ↓)

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

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

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

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

Note: See LCS/LCSD

No major matrix interferences were observed. VK

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 - 0625Q-MMB - LCS/LCSD All %Rs and RPDs were in control.

10.0 TCL Identification

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

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

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

Note: GW-AA-0-2-53-Dup. alpha-BHC (168.2%), delta-BHC (158.7%) → J.s, ok
GW-UAA-2-100Ft beta-BHC (162.3%) ~~(+)~~ → J.g
GW-AA-0-2-53 alpha-BHC (169.6%), delta-BHC (159.8%), Heptachlor (42.8%) → J.s, 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 ~~30%~~ 50% RPD for aqueous samples and ~~50%~~ 100% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL ~~(or RL) for water and 4 x CRDL (or RL) for soil will be used.~~ (JA)	[✓]		

Note:

	0-2-53	0-2-53 Dup		0-2-53	0-2-53 Dup.
α-BHC	0.079	0.082	delta-BHC	0.038	0.038
Heptachlor	0.022	0.016	gamma-chlordane	0.0084	0.0066
			Dieldrin	0.10 U	0.019
			Endosulfan II	0.013	0.10 U

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: 5

13.1.2 Number of target compounds in each analysis: 21

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

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

% Completeness = 100%

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: _____

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.: SAII07

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp. 1.1°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(-).		[✓]	
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.
6/20/02	6/26/02	6 days	6/28/02	2 days
6/21/02	6/26/02	5 days	6/28, 7/2	2, 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: MB- 0626C-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 <15% or R >0.995?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 6/28/02 1022-1227. All %RSDs were in control.

⊗ No Nonachlorobiphenyl — use decachlorobiphenyl for quantitation.

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.		[✓]	
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. 6/28/02 2102
7/2/02 0632.
7/2/02 1524

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: Use $^{13}C_{12}$-Decachlorobiphenyl (30-130%).

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-0-2-93Ft. All %Rs and RPDs were in control. (in SAII08)

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 - 0626C-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 > 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: All NDs in associated samples

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: All NDs

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil will be used.			

Note: GW-AA-0-2-53 GW-AA-0-2-53-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: 5

14.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = 100%

Note: _____

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

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII07

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. 1.1°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	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.
6/20/02	6/27/02	7 days	7/3/02	6 days
6/21/02	6/27/02	6 days	7/3/02	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: MB - 0627N - 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. 6/24-25/02 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. 7/3/02 0632 - All %Ds < 15%.

7/3/02 1753 2,4-DB -22.0% (DB-XLB)) J/UJ
2,4-DB -19.3% (DB-35MS).

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: Surrogate - 2,4-DCAA (>7-133%)

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 - GW-AA-0-2-93Ft. (In SDG: SAII08)
MCPP MS=198% (10-164%) → All NDs, ok
2,4,5-TP MSD=105% (10-100%) J.1 due to LCS failure 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 - 0627N-SMB.
Dalapon %R= 98% (26-97%) — All ND, ok.
245TP %R= 102% (10-100%). → 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:
GW-AA-0-2-53-Dup. 2,4,5-TP (118.6%) — J.1
GW-AA-2-100 Ft 2,4,5-TP (149.8%) — J.1
GW-AA-0-2-53 2,4,5-TP (121.1%), 2,4-DB (117.8%).
J.1 J.C

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? (JA) If No, J(+)/UJ(-) or professional judgement. (JA) For sample results > 5 x CRDL (or the RL), a control limit of ~~30%~~ 50% RPD for aqueous samples and ~~50%~~ 100% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL ~~(or RL) for water and 4 x CRDL (or RL) for soil will be used.~~ (JA)	[✓]		

Note:

	GW-AA-0-2-53	GW-AA-0-2-53 Dup.	RL.
245-TP	0.059	0.069	0.5
245-T	1.2	1.5	0.5

12.0 Data Completeness

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

12.1.1 Number of samples: 5

12.1.2 Number of target compounds in each analysis: 10

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

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

% Completeness = 100%

Note:

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

SDG No.: SAII07
Lab: STL-Savannah

Project Name: Sauget Area II
Reviewer: JA
Date: SAII07

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 1.1°C - 5.0°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	6/20, 21/02	7/9/02	18-19 days
Hg	6/20, 21/02	7/3/02	12-13 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: Section 3.4 - Several %Rs were out of MS/MSD and post-digestion spike. due to analyte concs in parent sample > 4X spiking conc. OK.

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

Action:

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

Note: CRDL.

Fe final 71% ↓
Pb initial 134% ↑, Final 132% ↑
Na final 68% ↓
Tl initial 122%, ↑ final 126% ↑

(60-140%)
All %Rs were slightly over the limit, no action was taken

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	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

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

Note:

7.0 Laboratory Control Sample (LCS)

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

Note:

8.0 Laboratory Duplicates

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

Note: See MS/MSD - All RPDs were in control.

9.0 Spike Sample Analysis -Pre-Digestion

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

Note: MS/MSD - not from Sampet Area II.
Ca MS = 229% MSD = 176%.
Mg MS = 132%.
Post-digestion - GW-UAA-2-60Ft
Ca -40%, Fe 2%, Mg 67%.
Since these analyte conc. in parent sample were greater than 4X spiking conc. 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-UAA-2-60Ft. All %Ds ≤10% (ICP metals)
GW-UAA-2-100Ft Na %D ≤10%
GW-AA-U-2-53Ft Hg — All NDs.

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 field duplicate results within control? (For aqueous sample, RPD values < 30% or difference < ± 2 x RL and For solids, RPD < 50% or difference < ± 4 x RL)	✓						✓					

Note:

	0-2-53	0-2-53 Dup	CRDL		0-2-53	0-2-53 Dup
Al	0.28	0.21	0.2	Mg	49	49
As	0.031	0.029		Mn	51	51
Ba	0.31	0.31		Ni	0.0059	0.040 U
Ca	280	280		K	16	16
Cr	0.0038	0.0036		Ag	0.010 U	~~0.00074~~ 0.010 U
Cu	0.0028	0.0020		Na	74	75
Fe	41	41		Zn	0.0081	0.0083

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

Project Name: Sauget Area II.
Project Number:
Laboratory: STL- Savannah
SDG No.: SAD07
Test Name: Ferrous Iron
Method No.: SM 3500.

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 1.0°C - 5.5°C

2.0 Holding Times

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

Notes:

Date Collected	Date Analyzed.	H.T
6/20/02	6/21/02	1 day
6/21/02	6/22/02	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 6/14/02 r = 1.000.
ICV/CCV All %Rs were in control

4.0 Blanks (Laboratory and Field)

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

Notes: PBW1 / PBW2 — same as CCB — ND's
ICB/CCB — All ND's

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

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

Notes: MS/MSD - GW-AA-0-2-13.
MS = 98% MSD = 97%.
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? only LCS	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?			✓
6.5	Were there any transcription /calculation errors?			✓

Notes: LCS / same as CCV — All %Rs were in control

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, contact your PM for guidance.	✓		
8.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes:

	GW-AA-0-2-53	GW-AA-0-2-53Dup	RPD
Ferrous Iron	5.993	5.935	0.97%.

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	NA
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.	✓		✓ NA
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: 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: Sanget Area II
Project Number:
Laboratory: STL - Savannah
SDG No.: SAII07
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.: 1.0°C - 5.5°C

2.0 Holding Times

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

Notes:

Date Collected	Date Analyzed	H.T.	
6/20/02	6/28/02	8 days	
6/21/02	6/27/02	6 days.	<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: MB - (batch 0627A) Alkalinity 10U / DR

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

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

Notes:

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

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

Notes: LCS. Methane 75% / K (75-125%)

LCS methane 91% / K

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, contact your PM for guidance. use 50% RPD for aqueous samples	✓		✓
8.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	-

Notes:

	GW-AA-0-2-53	GW-AA-0-2-53 Dup	RPD
CH4	13	18	32.3% / K

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: 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: Sanget Area II
Project Number:
Laboratory: STL-Savannah
SDG No.: SAII07.
Test Name: Methane
Method No.: STL 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. 1.1°C - 5.0°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
6/20,21/02	6/28/02	7, 8 days.

3.0 Instrument Calibration

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

Notes: I. Cal 6/12/02 0807-1131 r^2 = 0.987 (FID) → J, r. TCD detector r > 0.995
C. Cal 6/27/02 1441 (FID) %D < 25%,
1407 (TCD) %D ~~<~~ < 25%

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- IC0627MB 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-0-2-93FT
MS = 0% ↓ MSD = 12% ↓ (75-125%)
RPD = 24% (< 30%)

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

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

Notes: 6/27/02 LCS 99.8 % 34.7/34.8 = 99.7%
LCS 96.6 % 33.6/34.8 = 96.6%

7.0 Laboratory Duplicate

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

Notes: Lab dup. - S308SW-S1 169.1 mg/L / 176.2 mg/L RPD = 4.1%
SMW-2 219.2 mg/L / 209.8 mg/L RPD = 4.4%
GW-WAA-2-20FT 401.0 mg/L 401.7 mg/L RPD = 0.2

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, contact your PM for guidance. 50% for Aqueous sample.		✓	
8.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: GW-AA-0-2-53 GW-AA-0-253 Dup. RPD
Alkalinity 620 mg/L 580 6.7%
CO_2 33 mg/L 140 (123.7%) (*)

J, A

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.: SAII07.
Test Name: Nitrate-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: ~~5/22/02~~ 1.0°C - 5.5°C
JA

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.
6/20/02	6/21/02	1 day
6/21/02	6/22/02	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 5/22/02 r = 0.9998.
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: PBW1 (CCB1) — ND PBW2 (CCB1) 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: for Nitrate MS/MSD - GW-AA-0-2-13 MS=102%, MSD=101% RPD=1.1%
MS/MSD - GW-UAA-2-100FT. MS = 78%, MSD = 78%, RPD = 0.38%
0.2041/0.2 = 102.1% ok.

⊛ No MS/MSD for Nitrate

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 6/21/02 96% 0.4801/0.5 — Nitrate

LCS 6/22/02 91% 0.457/0.5

LCS 6/21/02 92%

LCSW2 89% / Nitrate

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 for Nitrate

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, contact your PM for guidance.	✓		
8.3	Were there any transcription /calculation errors noted in the duplicate data?		✓	

Notes: GW-AA-0-2-53 GW-AA-0-2-53 Dup.

NO_3-N 0.05U 0.05U

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: 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.: SAII07
Test Name: Sulfate
Method No.: 375.4

1.0 General: Chain-of-Custody/Data Deliverables

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

Notes:
Cooler temp 1.1 - 5.5°C

2.0 Holding Times

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

Notes:

Date Collected	Date Analyzed	H.T
6/20/02	6/27/02	7 day
6/21/02	6/27/02	6 days

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

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

Notes: LCS101 Sulfate 109% ✓ 22.457/20.65 = 108.7%

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: S244422-1 561.445 mg/L / 561.765 mg/L RPD = 0.057%

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-0-2-53 GW-AA-0-2-53-Dup

319.105 319.332

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 5/29/02 $r^2 = 0.9989 < \mu$
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: PBW1 ND (same as CCB-1).
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: S244222-3
Sulfate MS=73% ↓ ← (75-125%)
MSD=75%

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: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

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

Notes:

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

Reviewer: JA
Date:
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII08

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp. 1.1°C - 4°C.

2.0 Holding Time

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

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

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

Note:

Date Collected	Date Extracted	H.T.	Date Analyzed	H.T.
6/24-25/02.	—	—	7/1/02	6-7 days

		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 at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB 1P0703MB → Carbon disulfide 0.59 ug/L no pos. / no flag
" 1P0705MB → MCl3 0.58 ug/L
TB-062602 MCl3 0.29 ug/L, Chlorobenzene 0.46 ug/L
<10x U,y in <5x U,y in GW-AA-S-1-34FT
GW-AA-0-3-108FT

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?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal. 5/21/02 (MSP5-973) 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) between initial and continuing calibration RRF outside QC limits (%D < 20%)? 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 7/1/02 0957.

chloromethane +27.5%

7.0 Surrogate Recovery

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

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

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

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

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-0-7-93Ft

Chlorobenzene MSD = 60% ↓ (72-127%)

1. MS %R and RPD was in control
2. high chlorobenzene conc. in parent sample (matrix)
3. LCS %R was 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:

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:

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 II
Project Number:
SDG No.: SA II of

1.0 Chain of Custody/Sample Condition

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

Note:

Cooler temp 1.1°C - 2°C

2.0 Holding Time

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

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

Note:

Date Collected	Date Extracted	H.T.	Date Analyzed	H.T.
6/24/02	6/26/02	2 days	7/13, 15/02	17, 19 days
6/25/02	6/27/02	2 days	7/15/02	18 days

		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?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 7/12/02 1652-1913 All %RSDs or r^2 were in control.

C. Cal.
7/17/02 1902 2-nitroaniline +30.3% ↑
Pentachlorophenol 20.4% ↓. ≈ 20% 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%)? 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: 7/13/02 1022/1050 All %Ds were in control.
7/14/02 0912 All %Ds were in control.
0940 Dinoseb -37.8% ↓

7/15/02 0743/0817 All %Ds were in control.
7/15/02 2007 Hexachlorocyclopentadiene -20.6% ↓
4-nitrophenol +35.1% ↑
2,4-dinitrotoluene +23.1% ↑
4-nitroaniline +31.7% ↑

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: GW-UAA-2-124Ft-DL (1:5) for 1,4-dichlorobenzene only. → J,S

Nitrobenzene 0% } not recovered
2-Fluorobiphenyl 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: MS/MSD - GW-AA-0-2-93Ft

3,3'-dichlorobenzidine MS = 9% ↓ (10-144%) (JD) Reanalysis 4 ~~3.1~~%
MSD = 6% ↓ 0%

~~R, m~~ (JD)

N-nitrosodiphenylamine RPD = 27% (<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 - 0626B-ZBB3. All %Rs were in control
LCS - 0627B-ZMB3 - LCS/LCSD. All %Rs and RPDs were in control

10. Internal Standards

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

	Area > 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-02-93F+MS ~~AA~~ Acenaphthene-d10. 197407
207444-829778
1) This sample was re-analyzed and displayed acceptable IS peak area.
2) QC sample.

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?	JA [≠]		✓
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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil will be used.			

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.: SAII08

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 1.1°C - 4°C

2.0 Holding Time

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

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

Note:

Date Collected	Date Extracted	H.T	Date Analyzed	H.T.
6/24/02	6/26/02	2 days	7/3/02	7 days
6/25/02	6/27/02	2 days	7/3/02	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:

0626R-IMB All NDs

0627Q-IMB All NDs

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	[✓]		
4.2	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration?	[✓]		
	Linear — No flags			
	Non-linear — J(+) UJ(-)			
	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. 6/26/02 1240 - 06/27/02 0310 (SG1ZCD1)

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. only DDT and Endrin	[✓]		
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column? only DDT and Endrin	[✓]		
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: 6/26/02 1145) DDT/Endrin % Breakdowns were in control.
7/1/02 1011
7/2/02 2345
~~7/2/02~~
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 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: 7/1/02 1140 ECD1 2,4-DCAA -22.0%, TCMX -16.6%.
MB LCS/LCSD → ECD2 Heptachlor +20.4%, 2,4-DCAA -20.6%
7/1/02 2206 ECD1 (RTX CLP) Endrin aldehyde -16.5%, 2,4-DCAA -22.1%.
ECD2 (RTXCLP2) Heptachlor +18.2%, 2,4-DCAA -18.1%
7/3/02 0009 ECD1 (RTX-CLP) 4,4'-DDE -16.6%, 4,4'-DDD -21.8%, Endosulfan II -15.7%
Endrin ketone -21.5%, DCB -16.2%
Field samples → ECD2 (RTX-CLP2) Heptachlor -25.8%, 2,4-DCAA 17.2%.
7/3/02 1207 ECD1 (RTXCLP) 2,4-DCAA 23.4%
ECD2 (RTXCLP2). Heptachlor -17.4%, 2,4-DCAA 15.9%.

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: GW-AA-2-124Ft DCB 20%/22% ↓ (30-150%)
GW-AA-0-2-93Ft DCB 20%/17% ↓
GW-AA-0-2-93Ft MS DCB 28% ↓
GW-AA-0-2-93Ft MSD DCB 28%/26% ↓
GW-AA-0-3-68Ft DCB 17%/12% ↓

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

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

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

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

Note: MS/MSD - GW-AA-0-2-93FT
alpha-BHC MS = 240%, MSD = >30% (46-151%)
gamma-BHC RPD = 34% (<26%)
Endrin aldehyde MS = 0%, MSD = 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 - (0626R-IMB)) All %Rs and RPDs were in control.
LCS - (0627Q2-IMB)) LCS/LCSD

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.	[✓]	≠	(NA)
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-UAH-2-12-FT beta-BHC 41.4% (RPD)
GW-AA-0-7-93FT gamma-BHC 130.9%
GW-AA-0-3-68FT beta-BHC 64.7%

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil will be used.	[ ]		✓

Note:

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: 4
13.1.2 Number of target compounds in each analysis: 21
13.1.3 Number of results rejected and/or not reported: 4
% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)
% Completeness = 95.2%

Note:

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

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII 08

1.0 Chain of Custody/Sample Condition

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

Note:
Cooler temp. 1.1°C - 4°C

2.0 Holding Time

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

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

Note:

Date Collected	Date Extracted	H.T	Date Analyzed	H.T.
6/24/02	6/26/02	2 days	6/28, 7/2/02	2, 6 days.
6/25/02	6/26/02	2 days.	6/28/02	2 days

3.0 GC/MS Instrument Performance Check (IPC)

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

Note:

m/z 51, 68, 69, 70 not provided.
6/28/02 09:15 I. Cal, field sample.
7/2/02 05:22. field samples

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

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

Note:

0626C-KMB AMND.

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?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) — J(+)			
	Potential false negatives (use professional judgement) — R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I Cal (MSK5972) 6/28/02. All %RSDs were in control

No I. Cal for nonachlorobiphenyl — See lab comment.

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.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.	~~✓~~ (JA)	[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: 6/28/02 2102 All %Ds < 20%.

7/2/02 0632. All %Ds < 20%, ~~nonachlorobiphenyl RRT = 0.00031~~ (JA)

7/2/02 1524 All %Ds < 20%, ~~nonachlorobiphenyl RRT = 0.00043~~ (JA)

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: Use BC12 - Decachlorobiphenyl (30-130%)

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-0-2-93Ft

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 - 0626L-KMB All %Rs were in control.

No nonachlorobiphenyl.

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%~~ 30%	Area < -~~50%~~ 30%
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~~ 12 seconds of the associated calibration standard?	[✓]		

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

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

Note:

11.0 TCL Identification

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

Note: All NDs in field samples

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII08

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp 1.1°C - 4.0°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	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.
6/24/02	6/27/02	3 days	7/3/02	6 days
6/25/02	6/27/02	2 days	7/3/02	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: MB - 0627N-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 6/27-28/02 (SG SZ CD). 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: 7/3/02 0632 All %Ds < 15%.

7/3/02	1753	DB-XLB	2,4-DB	-22% ↓	J/UJ
		DB-35MS	2,4-DB	-19.3% ↓	

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-0-3-68FT. DCAA in primary column 138%↑ (27-133%) positive 2,4,5-T J's J non-detects 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 - GW-AA-0-2-93Ft.
MCPP MS=198% (10-164%). → LCS %R was OK
2,4,5-TP MSD=105% (10-100) → All NDs

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 - 0627N - SMB.
Dalapon 98%↑ (28-97%)) All ND in associated samples
2,4,5-TP 102%↑ (10-100%) OK

9.0 TCL Identification

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

Note:

10.0 TCL Quantitation and Reported Detection limits

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

Note: GW-UA-2-124Ft 2,4-DB RPD=40%
GW-DA-0-2-93Ft 2,4-DB RPD=92.8%
) These two results were previously flagged due to C. Cal failure, JK.

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 30% RPD for aqueous samples and 50% RPD for soil samples will be used. For sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) for water and 4 x CRDL (or RL) for soil 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.: SAII08
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 1.1°C - 4°C

2.0 Holding Time

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

Note:

Date Collected	Date Analyzed.	H.T.
6/24/02	7/3/02	9 days
6/25/02	7/3/02	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%).	✓						✓					
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.												
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:

Pb initial 135% ↑ Pb was not detected in the associated samples,

Tl initial 122% ↑) Tl was not detected in the associated
Final 137% ↑) samples, ok.

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	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note:

6.0 ICP Interference Check Sample (ICS)

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

Note:

7.0 Laboratory Control Sample (LCS)

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

Note:

8.0 Laboratory Duplicates

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

Note: See MS/MSD - All %RPDs were in control.
LCS/LCSD - All %RPDs were in control. (except Hg, only LCS).

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-0-2-93Ft.
MS - Ca, Fe, Na %Rs < 75%. Since Ca, Fe, and Na conc. in parent sample > 4X spiking conc, ok.
MSD - Ca, < 75%
Post-digestion spike - same
Ca, Fe, and Na conc > 4X spiking conc.

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: GW-AA-0-2-93Ft All %Ds were in control.
GW-AA-0-3-28Ft. K %D = 10.8%. → J's for this sample only.

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 field duplicate results within control? (For aqueous sample, RPD values < 30% or difference < ± 2 x RL and For solids, RPD < 50% or difference < ± 4 x RL)			✓						✓			

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: 4												
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:
Laboratory: STL-Savannah
SDG No.: SAIL08
Test Name: Dissolved Gas
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 1.1°C - 4°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.
6/24/02	6/28/02	4 days
6/25/02	6/29/02	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 6/12/02 (VMTFID) $r^2 = 0.987$ J.r.
C. Cal 6/27/02 1441
7/9/02 1407 All %Ds ≤ 15%.

4.0 Blanks (Laboratory and Field)

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

Notes: MB - 100677MB 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-0-2-93Ft.
Methane MS = 0% ↓ (75-125%) J/R
MSD = 12% ↓

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 - 1C0627MB. LCS%R = 75% (75-125%)

LCS - 2C0709MBLCS. LCS%R = 77%

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, contact your PM for guidance.			✓
8.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

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

Project Name: Sauget Area II
Project Number:
Laboratory: STL - Savannah
SDG No.: SA II 08
Test Name: Alkalinity / CO_2
Method No.: EPA 310.1

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

Notes:

Cooler temp: 5.1°C - 4°C.

(*) CO_2 determinations are a calculation of alkalinity from Method 310.1.

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	H.T.
6/24, 25/02	6/28/02	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: ⊗ Use 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: MB - <1.0 mg/L
MB02 <1.0 mg/L

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: LCSW01 – 96.6%
LCSW02 – 99.9%

7.0 Laboratory Duplicate

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

Notes: GW-UAA-2-20FT 401.0) RPD = 0.2%.
GW-UAA-2-20FT Dup. 401.7)
GW-AA-0-3-28Ft 466.8) RPD = 4.3%.
GW-AA-0-3-28Ft 487.3)

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, contact your PM for guidance.			✓
8.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

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: JJ
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.: SAII08
Test Name: Nitrate-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. 1.1°C - 4.0°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	
6/24/02	6/26/02	2 days	OK <48 hours.
6/25/02	6/27/02	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: I. Cal r = 0.9998
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 - 6/26/02 ND ICB/CCB All NDs
MB - 6/27/02 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-0-2-93Ft MS = 103.1%, MSD = 113%, RPD = 9.2% - 6/26/02

MS/MSD - GW-AA-0-3-68Ft MS = 100%, MSD = 99% RPD = 1.5% - 6/27/02

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: LCSW1 – 100%

LCSW2 – 90% 0.452/0.50 = 90.4%.
LCSDW2 – 89% 0.444/0.50 = 0.888
RPD=1.8%

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:

See MS/MSD or LCS/LCSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, contact your PM for guidance.			✓
8.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

9.0 Sample Results/Detection Limit Verification

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

Notes:

10.0 Data Completeness

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

Notes:

11.0 Surrogate Recovery

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

Notes:

DATA VALIDATION WORKSHEET

Conventional Analysis

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

Project Name: Sauget Area II
Project Number:
Laboratory: STL - Savannah
SDG No.: SAII08
Test Name: Sulfate
Method No.: 375.4

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

Notes:
Cooler temp. 1.1°C - 4.0°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.
6/25/02	6/27/02	2 days
6/26/02.	6/27/02	3 days

3.0 Instrument Calibration

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

Notes: I. Cal (5/29/02) $r^2 = 0.9989$.
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: MB - SO4 5.0 U.
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-0-293Ft MS = 73% ↓ (217.198 - 202.59)/20 = 73.0%
MSD = 75% (217.619 - 202.59)/20 = 75.1%
RSD = 0.46%

(*) Since sample result greater than 4x spiking conc. no data qualifying action was taken

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

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

Notes: LCS - SO4 109% 22.451/20.65 = 108.7% / N

7.0 Laboratory Duplicate

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

Notes: GW-CAA-2-124FT original 561.445 mg/L
Dup 561.765 mg/L
DF=25 RPD = 0.06%

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:

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

Reviewer: RA
Date: 8/15/02
Lab: STL

Project Name: Sauget Area II
Project Number: 21560888.06006
SDG No.: SAJT09

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
6/26/02	7/3/02, 7/4/02
6/26/02	7/3/02, 7/4/02, 7/5/02

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 at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB IP0703MB → Carbon disulfide 0.59 ug/L no pos. / no flag
" IP0705MB → MCl3 0.58 ug/L
TB-062602 MCl3 0.29 ug/L, Chlorobenzene 0.46 ug/L
< 10x 0.4 in GW-AA-0-3-108FT
< 5x 0.4 in GW-AA-S-1-34FT

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: ~~[illegible] RRF 0.05 [illegible] in all [illegible]~~ RA

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 - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 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 713102 2-butanone 21.2%. Pos. → J,L in GW-AA-S-1-84FT.

7.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note: DLs raised in some samples due to dilutions.

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-S-1-84FT	RL	GW-AA-S-1-84FT-DUP	
1,1-DCA →	0.49	1	.62	OK ✓
2-butanone	7	1	8.4	18% RPD OK ✓
TCE	.68		1U	
Toluene	.46		1U	OK
Chlorobenzene	22		22	0% 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: 8/15/02
Lab: STL

Project Name: SAUget
Project Number: 21540 888.06006
SDG No.: SAI009

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
6/26/02	7/1/02	7/16/02
6/28/02	7/3/02	7/18/02

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 - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 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 7/15/02 Several %D > QC See attached all ND, no flags
CC 7/16/02 " " " "

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:

LCS/LCSD were provided.

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

	Area > 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: IS areas > QC for 1,4-dichlorobenzene-d4, naphthalene-d8, acenaphthene-d10 in GW-AA-S-1-24 FT. and results → J!!

Sample was re-analyzed but all IS were > QC.

Use original results-

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-S-1-84FT All ND GW-AA-S-1-84FT-DUP All ND

14.0 Data Completeness

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

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

% Completeness = _____

Note: _____

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

Reviewer: RA
Date: 8/15/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SAII09

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:

collected	extracted	analyzed
6/26/02	7/2/02	7/9/02
6/28/02	7/3/02	7/9/02

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: Methoxychlor (19.1/19.8) 7QC both columns CC 7/9/02 1614
all ND→UJ/C unless prev. flagged -

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) 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-S-1-24FT decachlorobiphenyl 20/16% <(30-150) J/UJ,S
GW-AA-0-3-108FT " 13/9% J/R,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.

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: delta-BHC 98.4% in GW-AA-S-1-24FT, gamma-BHC (61.2), beta-BHC (43.5) in GW-AA-0-3-108FT all prev. flagged for sur. failure, 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:

13.0 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: 3

13.1.2 Number of target compounds in each analysis: 21

13.1.3 Number of results rejected and/or not reported: 19

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

% Completeness = 69.8% ~ 70%

Note: → Comment ←

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

Reviewer: RA
Date: 8/15/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SAII09

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	extract.	analyzed
6/26/02	7/3/02	7/10/02
6/28/02	"	"

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 <15% or R >0.995?	[✓]		
	Linear — No flags			
	Non-linear — UJ(-) J(+)			
	Potential false negatives (use professional judgement) R(-)			
5.3	Do any compounds have an RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
5.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

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.		[✓]	
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 was Provided -

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL Quantitation and Reported Detection limits

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

Note:

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

Note: _____

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

Reviewer: RA
Date: 8/16/02
Lab: STL

Project Name: Sauget Area II
Project Number:
SDG No.: SAII09

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
6/26/02	7/1/02	7/2/02
6/28/02	7/3/02	7/2/02

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. CC 7/2/02 0305		[ ]	✓

Note: MCPP (18%/15.6) both columns all ND, UJ/C in all samples. also pentachlorophenol (6.7) 2,4,5-TP 20%, 2,4,5-T 17% primary column. POS. 2,4,5-TP J/C in GW-AA-0-3-108FT. also 2,4,5-TP 18.6 Conf. Column 7/2/02 0034. prev. flagged. no more action.

6.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note: LCS/LCSD was 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: LCS/LCSD >QC 10-100 for 2,4,5-TP (102/112%).
LCS >QC " " 115% DOS. Prev. flagged. no more action

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: RPD>40% for 2,4,5-TP (164%) in GW-AA-0-3-108 FT. Prev. flagged, no more action.

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.: SAII09
Lab: STL

Project Name: Sauget Area II
Reviewer: RA
Date: 8/19/02

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
6/26, 28, 02 7, 9, 10, 16, 27, 02 ICP
" 7, 9, 11, 22, 02 Hg

3.0 Method Detection Limits (MDL)

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

Note:

4.0 Instrument Calibration

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

Note: CRDL > QC thallium 143%, lead 122%, Hg 78%.
NO POS.
no flags
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 → neg. for aluminum, arsenic, cobalt, thallium pos<5x J,P, ND → UJ, P.
MB → pos. for berullium, calcium, magnesium, pos. Be<5x → U, P in all -
ICB → neg. silver, thallium, → silver ND → UJ, P in all - Tl prev. flagged -
ICB → pos. for Be - prev. flagged - CCBs → neg. al, co, prev. flagged.
CCBs → pos. barium, be, Ca, copper, mg, mn, Tl., lead., V,

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:

.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:

.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: all MS/MSD → QC 218/245 Pos. → J, m unless prev. flagged.
Silver " " 134/135 → no pos., no flag

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: 8/19/02
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.: SA II 09
Test Name: Dissolved gases
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
6/26/02	7/10/02
6/28/02	7/11/02

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 R → 0.986 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: LCS/LCSD were provided –

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: 8/15/02
DV Level: II (III) IV
Review Document:
X NFG/SW-846 ___ Project QAPP/SAP
___ NJDEP/SW-846 ___ Region III/SW-846
___ NFG/CLP

Project Name: Sunset Area II
Project Number: 21560888.06006
Laboratory: STL
SDG No.: SA4109
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
6/26/02	6/27/02, 6/28/02, 7/2/02
6/28/02	6/30/02, 7/2/02, 7/10/02

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: LCS/LCSD provided and were acceptable-

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: Mitchadle
Date: August 16, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII10

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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

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 - 7/1/02, 7/2/02
Date Prepped -
Date Analyzed - 7/5/02 3 days, 4 days

3.0 GC/MS Instrument Performance Check (IPC)

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

Note:

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

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[✓]	

Note:

Method Blank (7/5)
- methylene chloride 0.31 ug/L

Trip Blank 070202
- styrene 0.36 ug/L

Trip Blank 070202
- styrene 0.22 ug/L

Hose Water
- chloroform 47 ug/L
- bromodichloromethane 8.6 ug/L
- dibromochloromethane 1.1 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: ICAL 7/4/02
bromomethane 27.9% J+ only

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 - %~~RSD~~ D < 50%, J(+) only; %~~RSD~~ D >50%, but <80% J(+)/UJ(-); %~~RSD~~ 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 7/5/02 @ 1025
bromomethane 41.2% J+ ~~p~~ only

7.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note:

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

13.0 Field Duplicate Samples

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

Note:

14.0 Data Completeness

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

14.1.1 Number of samples: _____

14.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

Note: _____

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

Reviewer: MMthacle
Date: August 16, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 10

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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

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

Note:

Date Sampled - 7/1/02, 7/2/02
Date Prepped - 7/3/02 1 day, 2 days
Date Analyzed 7/22/02, 7/23/02 19 days, 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 (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 - %RSD < 50%, J(+) only; %RSD >50%, but <80% J(+)/UJ(-); %RSD > 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 7/22/02 @ 1844

bis (2-chloroethyl) ether	22.9%
indeno(1,2,3-cd) pyrene	32.2%
benzo(g,h,i) perylene	26.0%

CCV 7/24/02 @ 0856

bis (2-chloroethyl) ether	-21.9%
bis (2-chloroisopropyl) ether	21.4%
n-nitroso-di-propylamine	27.9%
2,4-dinitrophenol	24.9%
4-nitrophenol	24.3%
4,6-dinitro-2-methyl phenol	27.6%

only MB associated with it.

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

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

		Yes	No	NA
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note:

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: MdShadle
Date: August 16, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 01560888
SDG No.: SAII10

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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

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

Note:

Date Sampled - 7/1/02, 7/2/02
Date Prepped - 7/3/02, 7/8/02 1day, 2days, 6days, 7days
Date Analyzed - 7/10/02 2days, 7days

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?	[✓]	JA	✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[✓]	JA	✓
	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.	[✓]	JA	✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[✓]	JA	✓
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.	[✓]	JA	✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[✓]	JA	✓
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 7/10/02 @ 1028 CCV 7/10/02 @ 1547
- heptachlor -17.6% 2,4-DCAA -30.4%/-25.9% surrogate
- 2,4-DCAA -27.6%/-25.9% -surrogate TMX -22.2% - surrogate
TMX -21.5% - surrogate methoxychlor /20.6%

7.0 Surrogate Recovery

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

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

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

Note: 44754-1 - decachlorobiphenyl #1 - 26% - other surrogate is okay 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: LCS/LCSD
- methoxychlor (46%)

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: 44754-1
gamma-BHC 107.7%
beta-BHC 46.7%

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:

13.0 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: _____

13.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

Note:

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

Reviewer: MeShadle
Date: August 16, 2002
Lab: STL- Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 10

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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

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 - 7/1/02, 7/2/02
Date Prepped - 7/3/02, 7/9/02 1 day, 2 days, 7 days, 8 days
Date Analyzed - 7/10/02 1 day 7 days

3.0 GC/MS Instrument Performance Check (IPC)

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

Note:

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 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: Middlebrooks
Date: August 16, 2002
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII10

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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

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 - 7/1/02, 7/2/02
Date Prepped - 7/3/02, 7/9/02 — 1 day, 2 days, 7 days, 8 days
Date Analyzed - 7/21/02, 7/23/02 — 12 days, 18 days, 20 days, 14 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze 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: Hose Water - dicamba 0.21 ug/L, 2,4-D 0.36 ug/L

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

Note:

CCV 7/21 @ 0305				CCV 7/21 @ 1034		CCV 7/23 @ 1412	
McPP	18% / 15.6%	2,4,5-T	17%	2,4,5-TP	18.6%	2,4,5-T	16.3%
PCP	16.7%	dinoseb	29.5%	dinoseb	27.2%		
2,4,5-TP	20%						

6.0 Surrogate Recovery

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

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

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

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

Note:

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

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

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

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

Note:

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

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

Note: LCS - 2,4,5-TP 115% ↑ LCS 2,4,5-TP 105% ↑

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: 44754-1 (GW-AA-S-3-132FT)
245-TP 58.8%

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:

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

Project Name: Sauget Area II
Reviewer: Mitshadle
Date: August 19, 2002

SDG No.: SAII10
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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

Note: Date Sampled - 7/1/02, 7/2/02
Date Prepped -
Date Analyzed - ~~7/2/02~~ 7/8, 7/9, 7/12, 7/13

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: ICB - Be 0.00019 CCB2 - As -0.0043 CCB3 - Ba 0.00166 Prep - As -0.00372 CCB4 - Ba 0.00198 ✓ 0.00148
CCB1 - Ba 0.00039 Ba 0.00054 Be 0.00067 Be 0.00044 Be 0.00089
Be 0.00019 Be 0.00041 Ca 0.01617 Co -0.00087 Cu 0.00132
Co -0.00082 Tl 0.00364 Cu 0.00128 Mn 0.00132
Tl - 0.00369 Mn 0.00132 Tl 0.00736
✓ 0.0017

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:

Post Spike

Silver 1349% ↑ / 135% ↑ Ca / 672 ↓ Iron - 38%

Mg / 23% ↓ Calcium - 24%

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: Mitchell
Date: August 20, 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: Sangat Creek II
Project Number: 01560888
Laboratory: STL - Savannah
SDG No.: SAII10
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 Temps - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Times

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

Notes:

Date Sampled - 7/1/02, 7/2/02
Date Prepped - -
Date Analyzed - 7/11/02 9 days, 10 days

3.0 Instrument Calibration

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

Notes:

Methane - $r^2 = 0.986$

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:

Hose water - 1ug/L

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, for %R > UCL, K(+) only; for %R < LCL, L(+)/UL(-), for %R < 30%, L(+)/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:

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, L(+)/UL(-).		✓	
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, contact your PM for guidance.			✓
9.3	Were there any transcription /calculation errors noted in the duplicate data?			✓

Notes:

10.0 Sample Results/Detection Limit Verification

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

Notes:

11.0 Data Completeness

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

Notes:

DATA VALIDATION WORKSHEET

Reviewer: M Schaelle
Date: August 20, 2002
DV Level: II III IV
Review Document:
____ NFG/SW-846 ____ Project QAPP/SAP
____ NJDEP/SW-846 ____ Region III/SW-846
____ NFG/CLP _____

Conventional Analysis
NO_3^-, CO_2, Alk, SO_4^{-2}

Project Name: Sauget Area II
Project Number: 21560888
Laboratory: STL-Savannah
SDG No.: SAII10
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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

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

Notes:

	NO_3^-	CO_2	Alk	SO_4^{-2}
Date Sampled -	7/1, 7/2	7/1, 7/2	7/1, 7/2	7/1, 7/2
Date Analyzed -	7/2, 7/3	Same day	7/10	7/8
	0 days, 1 day 2 days		8 days, 9 days	6 days, 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: JA
Date:
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII11

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp. 3.7°C - 5.2°C

2.0 Holding Time

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

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

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

Note:

Date Collected	TCLP extraction	Date Analyzed.	H.T. TCLP / Analysis
7/1/02	7/9/02	7/17-18/02	8 day / 8-9 days
7/2/02	7/12/02	7/18/02	10 days / 6 days

/ L

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: 6/17/02 1922 - I. Cal
7/17/02 1042 - TCLP Blank - MB (IA0712MB)
7/17/02 1048 -) field sample, MB. TCLP blank -
7/18/02 0943 -)

Instrument ID: ~~AB576~~ MSA5973

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

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed at least once every 12 hours for each GC/MS instrument used?	[✓]		
4.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?		[✓]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[ ]		✓
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

TCLP Blanks
0709T All NDs
0712T All NDs.

Method Blanks
IA0712MB All NDs
IA0717MB All NDs
IA0718MB 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 6/17/02 (MAS5973). 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%)? If yes, J(+)/UJ(-) or professional judgement - %~~RSD~~ < 50%, J(+) only; %~~RSD~~ >50%, but <80% J(+)/UJ(-); %~~RSD~~ > 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. – MAS5973

7/12/02 1214 2-butanone 63.3%, ↑ 1,2-dichloroethane 23.1% ↑

↳ TCLP blank – 0709T

7/17/02 1222 2-butanone 67.3% ↑ J(+)/UJ.

7/18/02 1046 2-butanone 42.1% ↑. J(+).

7.0 Surrogate Recovery

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

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 - 44842-1 (non-client sample)

2-butanone MS = 186% ↑ (42-167%)
MSD = 184% ↑

① Parent sample is non-client sample
② 2-butanone results were flagged due to C. Cal failure.

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 - IA0712MB 2-butanone %R = 184% ↑ (42-167%).
↳ TCLP blank - 0709T.
LCS - IA0717MB All %Rs were in control.
LCS - IA0718MB "

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: No Mass spectra were provided, check with lab.

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: Due to the abundance of target compounds, samples Waste-S-2-6'-T, Waste-S-1-6'-T, Waste-0-3-9'-T and Waste-0-2-7'-T were diluted by a factor of 2. RLs were raised.

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-0-1-4'-T	Waste-0-1-4'-T-Dup.	Difference/RPD	RL <2xRL
2-butanone	0.24	0.10 J	0.14 mg/L	0.10 / ok
Benzene	0.097	0.11	12.6% ~~0.13~~ (JN)	
Chlorobenzene	[illegible]	[illegible]	[illegible]	

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
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: ~~SAII0~~ SAII11

1.0 Chain of Custody/Sample Condition

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

Note:
Cooler temp.: 3.7°C - 5.2°C

2.0 Holding Time

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

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

Note:

Date Collected	TCLP Extraction.	H.T	Date Analyzed.	H.T.
7/1/02	7/8/02 - 7/9/02	7 (JA) ~~8~~ days	7/16/02	7 days
7/2/02	7/8/02 - 7/9/02	~~8~~ 7 days (JA)	7/16/02	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 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:

Instrument MS05973

7/12/02 1133. I. Cal.

7/16/02 1800 } ~~field samples, dilution, MB, LCS~~

7/16/02 2007

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:

0709D-DFB - fluid blank 1 All NDs

fluid blank 2 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. (MSD5973) 7/12/02 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 - %~~RSD~~ < 50%, J(+) only; %~~RSD~~ >50%, but <80% J(+)/UJ(-); %~~RSD~~ > 80% R(+/-). (%D) (%D) (%D)	✓	[✓]	(NA)
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 (MSD5973)

7/16/02 0821 2,4,6-Tribromophenol -21.4% surrogate ok.

7/16/02 2024 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:

All surrogates were diluted out in samples WASTE-S-1-COMP-T and WASTE-O-3-Comp-T DF=10, ok

All base/neutral surrogate were not recovered. in diluted samples WASTE-O-1-comp-T and WASTE-O-1-COMP-T-DUP. DF=5, only Pentachlorophenol ~~J,se~~ (A) was use for data interpretation

→ acid fraction surrogate recoveries were 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:

Due to insufficient sample volume, MS/MSD were not extracted in batch 0709D.

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. 0709D-DFB. All %Rs and RPDs were in control.

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note: Pentachlorophenol cons. > linear range in four samples. J, q

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:

	0-1-COMP-T	0-1-COMP-T-Dup				COMP-T	COMP-T-D
1,4-Dichlorobenzene	0.46	0.44	4.4%	246-TCP	9.8%	0.29	0.32
2-Methylphenol	0.018 J	0.021 J		PCP	37.8%	1.5	2.2
3,4-Methylphenol	0.21	0.26	21.3%	Total Cresols	19.6%	0.23	0.28
[illegible]	0.21	0.21	[illegible]	[illegible]		[illegible]	[illegible]

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: 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:
SDG No.: SAII 11

1.0 Chain of Custody/Sample Condition

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

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

Note: Cooler temp. 3.7°C - 5.2°C

2.0 Holding Time

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

Matrix	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	TCLP Extraction	H.T.	Extraction	H.T	Date Analysis	H.T
7/1/02	7/8-9/02	7-8 days	7/9/02	—	7/11/02	2 days
7/2/02	7/8-9/02	6-7 days	7/9/02	—	7/11/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

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

Note:

0709P-RFB1 All NDs
) fluid blank
0709P-RFB2 All NDs

0709P-RMB All NDs — method blank

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 7/8-9/02 1754-0052 (SGRBED).
All %RSDs or r²s 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:

7/8/02 1732 } %DDT and Endrin were in control.

7/11/02 1101

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: 7/11/02 1123 - RTX-CLP 24-DCAA -27.5%, TCMX -18.6%, DCBP -16.0%
RTX-CLP2 2,4-DCAA -26.2%

7/11/02 1733. RTX-CLP 2,4-DCAA -28.0%, TCMX -21.3%.
RTX-CLP2 Methoxychlor 20.8%, 2,4-DCAA -25.2%
→ J(+) on WASTE-0-3-COMP-T.
⊛ All others are surrogates, ok

7.0 Surrogate Recovery

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

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

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

Note:

WASTE-0-1-COMP-T DCBP 21% ↓ on primary column, 2,4-DCAA 19% ↓ (30-150%)
→ ok.

WASTE-0-1-COMP-T-Dup DCBP 26% ↓ TCMX 29% ↓ on primary column. 2,4-DCAA 21%/19%
→ UJ, s

⊛ 2,4-DCAA results for evaluating ~~propose~~ purposes only, not for quality control purposes.

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

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

Note: No MS/MSD in this SDG.

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: one LCS/LCSD pair All %Rs and RPDs were in control

10.0 TCL Identification

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

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

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

Note: (X) Internal standard area - 0-1-COMP-T (295669↑), 0-1-COMP-T-Dup (302440↑) (64366-193098) — All NDs, vk

(X) S-2-COMP-T gamma-BHC (76.2%), Heptachlor (50.0%.) → J, g

0-3-COMP-T Methoxychlor (58.8%) → J, c previously, vk

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-0-1-COMP-T WASTE-0-1-COMP-T-Dup

All NDs All NDs

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: 6

13.1.2 Number of target compounds in each analysis: 7

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

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

% 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.: SAII11

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp. 3.7-5.2°C

2.0 Holding Time

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

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

Note:

Date Collected.	TCLP Extraction	H.T	Extraction	H.T	Analysis	H.T.
7/1/02	7/8-9/02	7-8 days	7/9/02	–	7/11/02	2 days
				DL-	7/23/02	14 days
7/2/02.	7/8-9/02	6-7 days	7/9/02	–	JA ~~7/11/02~~ 7/23/02	14 days

) 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: MSF5972

6/28/02 0915 I. Cal.
7/22/02 0720 I. Cal
7/11/02 0577) field samples.
7/23/02 1442 —

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?	[ ]		✓
4.6	Apply the 5X rule per the National Functional Guidelines Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note:

0709G-KFB All ND's - Fluid Blank 1

0709G-KFB All ND's - Fluid Blank 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 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 680 the response factor for Decachlorobiphenyl is used to quantitate Nonachlorobiphenyl.

MSK5972 I. Cal 6/28/02 All %RSDs <15%.

7/22/02 All %RSDs <15%.

6.0 Continuing Calibration

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

Note: C. Cal. 7/11/02 0620.

7/11/02 1410.

All %Ds < 20%.

7/23/02 1542

All RRF ≥ 0.05

7/24/02 0058.

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: ⊗ use $^{13}C_{12}$-Decachlorobiphenol (30-130%).

All %Rs were in control.

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

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

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

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

Note: No MS/MSD in this SDG. See LCS/LCSD

9.0 Laboratory Control Sample (LCS)

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

	> 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: One LCS/LCSD pair, all %Rs and RPDs were in control.

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note:

12.0 TCL Quantitation and Reported Detection limits

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

Note: Monochlorobiphenyl in sample WASTE-0-3-COMP-T exceeded the linear range - J,J

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:

	0-1-COMP-T	0-1-COMP-T-DUP.	RPD
Mono-	0.050	0.039	25%
Dichloro	0.013	0.0098	28%
Trichloro	0.0035	0.0025	33%

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: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII 11

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: 3.7°C - 5.2°C

2.0 Holding Time

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

Matrix	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	TCLP Extraction	H.T	Extraction	H.T	Analysis	H.T.
7/1/02	7/8-9/02	7-8 days	7/9/02	—	7/24.26/02	15-17 days
7/2/02	7/8-9/02	6-7 days	7/9/02	—	7/23-26/02	14-17 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 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: 0709N-FB1, 0709N-FB2 — All NDs (Fluid Blank
MB- 0709N-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 (SGSECD).
DB-35MS) All %RSDs < 20%
DB-XLB)

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: 7/23/02 1412 DB-XLB. ~~2,4,5-T 16.3%~~ N.T.C (A) N.T.C
7/26/02 1251 DB-XLB 2,4-D 18.6% ~~Pentachlorophenol 17.5%~~, 2,4,5-TP 17.7%
(A) ~~2,4,5-T 16.9%~~ N.T.C
7/26/02 1721 DB-XLB ~~Dicamba 15.6%~~, ~~Pentachlorophenol 18.0%~~ 2,4,5-TP 16.6%

6.0 Surrogate Recovery

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

most diluted and reanalyzed.

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-0-1-COMP-T 2,4-DCAA 2150% ↑, WASTE-0-1-COMP-T DUP 2,4-DCAA >500% ↑.
WASTE-S-1-COMP-T 2,4-DCAA 5500% ↑, WASTE-0-3-COMP-T 2,4-DCAA- 2800% ↑.
0-1-COMP-T, 0-1-COMP-T-Dup, and 0-3-COMP-1 → surrogate diluted out, ok
(DF=10) (DF=10) (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: see LCS/LCSD

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: one LCS/LCSD pair

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:

	0-1-COMP-T	0-1-COMP-T-Dup.	RPD/Different	RL.
2,4-D	1.4	2.4	52.6%	
2,4,5-TP	0.0041	0.0069	0.0028 mg/L	0.025

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: 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.: SAJ 11
Lab: STL-Savannah

Project Name: Sauget Area II
Reviewer: JA
Date:

1.0 Chain of Custody/Sample Condition/Raw Data

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

Note: Cooler temp. 3.7°C - 5.2°C.

2.0 Holding Time

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

Note:

Date Collected.	TCLP Extraction	H.T.	Extraction	H.T.	Analysis	H.T
7/1/02	7/8-9/02	7-8 days	7/11-13/02	—	7/18/02	9 days
7/2/02	7/8-9/02	6-7 days	7/11-13/02	—	7/18/02	9 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?		✓						✓				
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis? TCLP			✓						✓			
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 final 130% ↑ slightly over, ok.

Hg r = 0.999985 / ok

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:

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 data not provided - check with lab.

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 - 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:

	0-1-COMP-T	0-1-COMP-T-Dup.	RL
As	0.077	0.20 U	0.2 mg/L
Ba	1.5	1.4	1
Cd	0.18	0.17	0.1
Pb	0.24	0.18 UJ	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: 6												
12.1.2	Number of target compounds in each analysis: 8												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%												

Note:

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

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

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII 12

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 - 3.9°C, 4.4°C, 4.8°C, 5.2°C, 4.2°C, 4.1°C, 3.7°C, 3.8°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:

Sample Id
Date ~~Analyzed~~ - 7/2/02, 7/1/02
Date Analyzed - 7/11/02, 7/15/02
10 days, 14 days, 9 days, 13 days

3.0 GC/MS Instrument Performance Check (IPC)

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

Note: _____

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

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

Note: _____

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 (7/11/02) INST. MS05973
RRF 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 7/11 @ 0909
- $MeCl_2$ -32.6% ↓ all associated sample results NS - no action taken.

CCV 7/15 @ 0829
1,1-dichloroethane 30.6% ↑ - J+

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[✓]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) 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: ~~LCSD~~ RPD. $MeCl_2$ (34%) - LCS & LCSD okay

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:

acetone 1300/500 = 88.8% okay
2-butanone 30/16 = 60.9% okay
chloroform 6.6/ND okay
1,1,1-TCA 6.3/ND okay
benzene 700/46 = 175% ✓
MIBK 390/51 = 154% ✓
ethylbenzene 200/27 = 152% ✓
xylene 820/110 = 143%

14.0 Data Completeness

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

14.1.1 Number of samples: 8

14.1.2 Number of target compounds in each analysis: 33

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

% 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: Mitchell
Date: Sept 4, 2002
Lab: STL - Savannah

Project Name: Sauget Area 2
Project Number: 21560888
SDG No.: SATI12

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 - 3.9°C, 4.4°C, 4.8°C, 5.2°C, 4.2°C, 4.1°C, 3.7°C, 3.8°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 - 7/1/02, 7/2/02
Date Prepped - 7/5/02, 7/8/02 — 3 days, 6 days, 4 days, 7 days
Date Analyzed - 7/23/02 — 18 days, 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:

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 (7/24 @ 0830)
4-nitrophenol 24.7% - no associated 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:

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

dimethylphthalate	45%	1,2-dichlorobenzene (27%)
n-nitrosodiphenylamine	40% / 50%	3-nitroaniline (40%)
butyl benzyl phthalate	49%	dibenzo(a,h)anthracene (26%)
benzo(a) anthracene	49%	
chrysene	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

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

Note:

10. Internal Standards

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

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

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

		Yes	No	NA
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	[✓]		

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

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

Note:

447548-1 - phenanthrene-d10 967985/453006 = 214%
- affected analytes flagged "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/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:

1,4-dichlorobenzene 79,000/15,000 136% ✓ pentachlorophenol 800,000/350,000 78.2% chem benzo(b)fluoranthene 9100/6100 = 39.4% ✓
1,2-dichlorobenzene 130,000/37,000 131% ✓ phenanthrene 21,000/9800 72.7% chem benzo(a)pyrene 8600/2000 = 42.3% chem
1,2,4-trichlorobenzene 31,000/13,000 81.8% chem benzo(a)anthracene 18,000/7,200 64.1% chem benzo(g,h,i)perylene 6100/4000 = 41.6% chem
2-methylnaphthalene 35,000/12,000 85.7% chem chrysene 31,000/17,000 58.3% chem

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: 6

14.1.2 Number of target compounds in each analysis: 67

14.1.3 Number of results rejected and/or not reported: 67

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

% Completeness = 335 / 402 = 83.3%

Note:

Sample SOIL-0-2-6' displayed low recoveries which resembled carryover.
Sample flagged "R,Q".

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

Reviewer: MWhadle
Date: Sept 4, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII12

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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

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

Note:
Date Sampled - 7/1/02, 7/2/02
Date Prepped - 7/5/02 3 days, 4 days
Date Analyzed - 7/12/02, 7/15/02 7 days, 10 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 (7/12 @ 1059)		CCV (7/15 @ 1642)		CCV (7/15 @ 2056)	
2,4-DCAA	-24.7% / -27.8%	enrin aldehyde	-23.3% /	heptachlor	-15.5% / 28.8%
CCV (7/12/02 @ 1908)		2,4-DCAA	-22.4% / -30.3%	2,4-DCAA	-23.7% / -29.3%
2,4-DCAA	-24.2% / -23.5%	heptachlor	/ 23.5%	TMX	-15.6% /
TMX	/ -15.2%	endosulfan II	/ 16.1%		

7.0 Surrogate Recovery

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

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

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
- endrin (34%)
4,4'-DDT (28%)
methoxychlor (43%)

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: 44632B-1
gamma-BHC 89.2%, dieldrin 113% ✓
heptachlor 84.6%, 4,4'-DDT 189.6% ✓
delta-BHC ✓51.4%

44632B-2
gamma-BHC 70.3%, heptachlor epoxide 157%
beta-BHC 173.5%, 4,4'-DDT 125.1% ✓
delta-BHC ✓84.2%, endrin aldehyde 114.7% ✓

44632B-3
beta-BHC 176.3%, 4,4'-DDT ✓120%
heptachlor ✓117.4%
delta-BHC ✓120%
heptachlor epoxide 178.8% ✓

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: gamma-BHC 4800/~~4800~~ 3840 - okay delta-BHC 5300/~~2000~~ 3450 1600 = ~~90.4%~~ 107% J/US 4,4'-DDT 5300/~~3750~~ 3000 okay
1026 beta-BHC 1700/~~440~~ 352 = ~~118%~~ 131% J/US heptachlor epoxide 640/~~700~~ 640 = okay endrin aldehyde 1600/ND (800) - ~~[illegible]~~ J/US okay
heptachlor 5300/~~1250~~ 1000 = ~~124%~~ 137% J/US dieldrin 6800/~~4000~~ 3200 ~~57.9%~~ 72%

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: _____

13.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

Note: _____

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

Reviewer: MSShadle
Date: Sept 4, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SA II 12

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 - 3.9°C, 4.4°C, 4.8°C, 5.2°C, 4.2°C, 4.1°C, 3.7°C, 3.8°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 - 7/1/02, 7/2/02
Date Prepped - 7/9/02 7 days, 8 days
Date Analyzed - 7/12/02 3 days
7/13/02 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/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:

	MS/MSD			
mono	PCB 1016	16%/16%	octa	28%/31%
tri	~~PCB 1232~~	0%/0%		
tetra		0%/0%		
penta		12%/0%	due to matrix effect, no action taken	
heka		26%/19%		
hepta		25%/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

		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.

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

Note:

447548-1 159702/115308 138.5%

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:

10 - ~~10300~~ 103000 / 97500 500 - 42,000 / 55,000
200 - 78000 / 87500 600 - 13,000 / 14750
300 - 56000 / 95000 700 - 12,000 / 14,500
400 - 93000 / 120,000

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: MWhadle
Date: Sept 5, 2002
Lab: STL - Savannah

Project Name: Sauget Area II
Project Number: 21560888
SDG No.: SAII12

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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

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 - 7/1/02, 7/2/02
Date Prepped - 7/10/02 8 days, 9 days
Date Analyzed - 7/25/02, 8/10/02 15 days, 27 days

3.0 Blanks (Method Blanks and Field Blanks)

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

Note: Method Blank - PCP - 59 ug/kg (7/25) Method Blank - PCP 16 ug/kg (outside of hold) 8/5/02 not used

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

Note: CCV 8/1/02 @ 2238 2,4-DB / -19.8

CCV 8/2 @ 12:42 MCPP 19.4% / 2,4-D 16.7% / PCP 15.5% /

CCV 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% dimoseb -24.4% / -23.0%

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:

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

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

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

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

Note:

8.0 Laboratory Control Sample/Duplicate (LCS/LCSD)

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

Note: LCS - PCB - 0% (7/25) LCS PCP 209% (8/5)

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:

44632B-1		44632B-2		44632B-4		44632B-5	44632B-5RE
MCPP - 119.1%		2,4,5-T	74.7%	2,4-D	46.8%	MCPP 168.4%	2,4-D 84.4%
				2,4,5-T	125.9%	2,4-D 103%	

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:

2,4-D	84,000 / 12 000 ~~42,000 / 24,000 = 57.5%~~	150%	J,F
PCP	220,000 / 210,000 - ND		
2,4-T	6200 / 20,000 - ND		

12.0 Data Completeness

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

12.1.1 Number of samples: _____

12.1.2 Number of target compounds in each analysis: _____

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

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

% Completeness = _____

Note: _____

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

SDG No.: SAII12
Lab: STL - Savannah

Project Name: Sauget Area II
Reviewer: Mitthadle
Date: Sept 5, 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 - 4.2°C, 4.1°C, 3.7°C, 3.8°C, 3.9°C, 4.4°C, 4.8°C, 5.2°C

2.0 Holding Time

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

Note:
Hg
Date Sampled - 7/1/02, 7/2/02 7/1/02, 7/2/02
Date Prepped - 7/13/02 - 11 days 12 days
Date Analyzed - 7/18/02, 7/19/02, 7/16/02, 7/15/02 7/17/02, 7/23/02 15 days, 16 days
2 days, 3 days, 5 days, 6 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 132% ↑
Pb 78% ↓
Tl 69% ↓

CRDL
Pb 74% ↓ / 78% ↓

slightly out
no action taken

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 24.1 CCB1 Al 24.0 CCB2 Al 26.1° CCB3 Al 23.2 Ba 1.55 Mn 1.79 Cr 1.20 Cu 1.92 V 1.19 Prep Al 2.68 As -0.373 Cd -0.07 Cr 0.0875 Co -0.058 Na 18.8 Tl -0.557 CCB4 Al 25.3 Ba 1.34 Cr 0.938 Cu 1.69 Mn 1.28 CCB5 Al 26.1 Ba 1.21 Cr 1.22 Mn 1.26 V 1.50

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: Hg - 40.8%

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 689% ↑ / 816%
Sb 67% ↓ / 67%
Ca 157% ↑ / 146%
Fe -6525% ↓ / -5968%
} from different client

Mg 134% / 173%
Mn 39% / 64%

Hg -195% 74x spike amt
Hg - 0% - 4x spike amt.

Post - Al 34%
Ca 58%
Fe -130%
Mg 74%
} Present sample amt. 74X spike amt

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: Ni 11% ?
K 10.6% } previously flagged.

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: Hg - 40.8%

Zn: 150 / 49 = 101.5%

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.: SAII13

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: 3.8°C - 5.2°C
- only reported waste samples, other samples → in other SDGs.

2.0 Holding Time

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

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

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

Note:

	Date Collected.	Date Analyzed.	H.T	
	7/1, 2/02	7/15/02	13, 14 days.	
(*) Waste-0-39'M	7/1/02 1415	7/16/02 0001	15 days	→ J/UJ. h

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. (MS05-973)
5/21/02 0848 I. Cal (MSP5973)
7/15/02 0756 — batch 10Ø715MB
7/15/02 0717 — batch 2PØ715MB

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 - 10Ø715MB Toluene 86 ug/L. x 5 → 430 ug/L
Since all results greater than action level, OK.
MB - 2PØ715MB - 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 (MS05973) 7/11/02 All %RSDs or r^2 were in control. Acetone $\overline{RRF}$ = 0.0489. J/R.

I. Cal (MSP5973) 5/21/02 All %RSDs or r^2 were in control RRFs ≥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. (MS05973) 7/15/02 0829. 1,1-dichloroethane 30.6% D J(+)
Acetone RRF = 0.04562. J/R

C. Cal. (MSP5973) 7/15/02 1733. Carbon disulfide −22.6%.
↳ ND in associated samples, OK. (<50%).

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
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-S-1-6', Waste-S-2-6'DL, Waste-O-1-4'DL, Waste-O-2-7'DL, Waste-S-1-6'DL All surrogates were diluted out. OK (not recovered).

– Waste-O-2-7', waste-O-2-9', and Waste-S-2-6' → diluted out, OK.

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

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

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

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

Note:

9.0 Laboratory Control Sample (LCS)

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

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

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

Note: LCS - 10Ø715MB - All %Rs were in control.

LCS - 2PØ715MB - Bromomethane LCS 13% ↓ (23-173%) RPD=14.2% (<79%) J/R.
(LCS/LCSD) Acetone LCS 160% ↑ (43-154%) J(+).) All ND, Jn
2-hexanone LCSD=130% ↑ (45-127%) 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 + 5DL

14.1.2 Number of target compounds in each analysis: 33

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

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

% Completeness = 98.2%

Note:

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

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII 13

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp.: 3.7- 5.2°C

2.0 Holding Time

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

Matrix	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	H.T.	Date Analyzed	H.T.
	7/1/02	7/5/02	4 days	7/23, 24/02	18, 19 days
	7/2/02	7/8/02	6 days.	7/23, 24/02.	15, 16 days.
waste-0-3-02 comp (*)	7/1/02	7/5/02.	4 days.	8/23/02	49 days

26
23
49

J, h → RCP only
others not used for data

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 I. Cal
7/20/02 0819 I. Cal
7/22/02 1947, 7/23/02 0915, 7/24/02 0813.
8/22/02 1320 - I. Cal / Waste-0-3-COMPOL.

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:

0705B-BMB. All NDs

0708C-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 7/12/02 – Dinoseb.) All %RSDs or r^{-2} were in control
I. Cal 7/20/02 – All others. RRF ≥0.05
I. Cal 8/22/02 –

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20%)? 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 2012, 7/22/02 2046.) All ~~%RSDs or~~ %Ds r^{-2} were in control
7/23/02 0937, 1006 RRF ≥0.05
7/24/02 0830 4-nitrophenol 24.7%. / [illegible]
7/24/02 0859. [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? several samples were re-analyzed on dilution.	[✓]		
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.			

* only sample on DF=5 J/UJ

	> 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-O-3-COMP (DF=10), Waste-O-3-COMP DL (DF=100) →

— Waste-S-1-COMP (DF=10), Waste-S-2-COMP (DF=10), Waste-S-2-COMP DL (DF=50)

— Waste-O-1-COMP DL (DF=250). Waste-O-1-COMP (DF=5) → 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 - 44632B-1.

— N-nitroso-diphenylamine MS=40%↓ MSD=50%↓ (51-132%)

— Dimethylphthalate MS=45%↓ (49-130%), Butylbenzylphthalate MS=49%↓ (58-122%)

Benzo(a)anthracene MS=49% (54-137%) Chrysene MS=50% (56-133%).

— 1,3-dichlorobenzene RPD=27% (<24%), 3-nitroaniline RPD=40% (<28%)

Dibenzo(a,h)anthracene RPD=26% (<24%)

MS/MSD - 44784B → most of MS/MSD recoveries and 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 - 0705B - BMB All %Rs were in control

LCS - 0708C - 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?	[✓]		✓ TA
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: TIC results were reported in raw data.

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: 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:
SDG No.: SAII13

1.0 Chain of Custody/Sample Condition

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

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

Note: Cooler temp. 3.7°C - 5.2°C

2.0 Holding Time

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

Matrix	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.
7/1, 2/02	7/10/02	8.9 days	7/11, 16/02	1.6 days

3.0 Blanks (Method Blanks and Field Blanks)

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

Note:

MB - 0710N - I 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 6/26-27/02 primary/confirmation - All %RSDs or r^2 were in control

(*) Waste-0-1-COMP - IS (Bromonitrobenzene) 257978↑ (192%) J(+).
67230-201692.

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: 6/26/02 1145) All % Breakdowns were in control
7/11/02 1041
7/16/02 1123.

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: 7/11/02 1105 RTX-CLP Heptachlor -15.5%, 4,4'-DDT -25.7%, Endrin aldehyde -16.8%, Methoxychlor -23.7%. 2,4-DCAA -22.9%

RTX-CLP2 Heptachlor 18.8%, Methoxychlor -17.7%, 2,4-DCAA -22.8%.

1945 RTX-CLP Heptachlor -23.1%, 4,4'-DDT -34.9%, Methoxychlor -22.1%, 2,4-DCAA -23.1%, TCMX -15.7%.

RTX-CLP2 4,4'-DDT -23.6%, Methoxychlor -25.7%, 2,4-DCAA -28.7%, TCMX -16.7%.

7/16/02 1148 RTX-CLP 2,4'-DCAA -25.1%, TCMX -15.5%.

RTX-CLP2. Heptachlor 16.1%, 2,4-DCAA -34.5%.

1559 RTX-CLP 2,4-DCAA -23.5%, ~~TCMX -15.2%~~ ≥15% ok.

RTX-CLP2 Heptachlor 38.7%, 2,4-DCAA -28.7%.

Heptachlor - ND in associated sample 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: — LCS - 2,4-DCAA 29% ↓ (30-150%)

— The following samples - surrogates were diluted out!

Waste-O-3-COMP (DF=100), Waste-S-1-COMP (DF=10), Waste-S-2-COMP (DF=10)

Waste-O-1-COMP (DF=250), Waste-O-1-COMPDL (DF=500).

— Waste-O-2-COMP. TCMX 220% T in confirmation column. Since 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 summary form were not provided – check with lab. See case narrative.

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 - 0710N-1MB. All %Rs were in control.

10.0 TCL Identification

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

Note:

11.0 TCL/TIC Quantitation and Reported Detection limits

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

Note: Several RPDs >40% in each samples, J, g, see attached.

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:

13.0 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: 5

13.1.2 Number of target compounds in each analysis: 21

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

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

% 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.: SAII13

1.0 Chain of Custody/Sample Condition

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

Note:

Cooler temp: 3.7°C - 5.2°C

only waste samples 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(-).		[✓]	
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.
7/1,2/02.	7/9/02	7.8 days	7/12,13/02	3.4 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for 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: 6/28/02 0915 I. Cal.
7/12/02 0740) field samples
7/13/02 0857

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?		(NA) [✓]	✓
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 - 0709B - 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. 6/28/02 All %RSDs were in control.
RRF ≥ 0.05
7/13/02 All %RSDs were in control (≤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 7/12/02 0917. All %Ds <30% (for soil/waste).
1936. All %Ds <30%.
7/13/02 1850. 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: All surrogates were ~~dilution~~ diluted out.
-Waste-0-3-COMP (DF=100),
-Waste-0-2-COMP (DF=20), Waste-S-1-COMP (DF=20), Waste-S-2-COMP (DF=20),
-Waste-0-1-COMP (DF=500), Waste-0-1-COMP.D2 (DF=1000).

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-0-2-6' (SAII12).
Several MS/MSD recoveries were out see attached.
Trichlorobiphenyl, Tetrachlorobiphenyl, and Pentachlorobiphenyl 0% recoveries J/~~UJ~~R
others since LCS recoveries were ok, no data qualifying action was 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: LCS - 0709B-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-0-1-COMP	244 844	(212%)	J(+)
Waste-0-1-COMP-DL	157 477.	(131%).	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:

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~~ 1

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

% Completeness = 98% ~~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.: SAII13

1.0 Chain of Custody/Sample Condition

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

Note: Cooler temp 3.6°C - 5.2°C
only waste samples - others in different SDGs.

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.
	7/1,2/02	7/10/02	8.9 days	8/1/02	22 days.
446326-4 RE	7/1/02	7/31/02	30 days.	8/2/02	2 days.

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: 07100-SMB (TA) ~~Pet~~ Pentachlorophenol (PCP) 59 ug/kg $\xrightarrow{V5}$ 295 ug/kg U.Z.
0731N-SMB PCP (TA) 16 ug/kg. $\xrightarrow{V5}$ 80 ug/L U.Z.

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.
I. Cal 8/4-5/02 All %RSDs or r^2 were in control

5.0 Continuing Calibration

8/5/02 2219 PCP -21.3%/-19.7%, 245-TP -23.8%/-21.9% Dinoseb -24.4%/-23.0%
245-T -25.4%/-23.4%, 2,4-DB -27.0%/-18.0%

		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. 7/25/02 1309) All %Ds were in control
7/26/02 0135)
8/1/02 1017 MCPP 16.4%. (DB-XLB).) MCPP and 2,4-DB were ND in associated samples
8/1/02 2238 DB-35MS 2,4'-DB -19.8%.)
44632C-4 RE → 8/2/02 1242 DB-XLB. MCPP 19.4%, 2,4-D 16.7%; PCP 15.5%.
8/5/02 0934 All %Ds were in control.

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: Except Waste-S-2-COMP, all surrogates were diluted out. N
44632C-1 (DF=4000), 44632C-2 (DF=100), 44632C-3 (DF=500).
44754C-1 (DF=5000).

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-O-1-COMP. summary table 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.		[ ]	✓
8.5	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - 07100-SMB. PCP 0% ↓ (blank contamination). ~~→ J/UJ~~ (10-150%).
LCS - 07310-SMB PCP >09% ↑

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 RPDs ≥ 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:

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: Sample Waste-S-2-COMP was re-extracted due to blank contamination, but exceeded two times the hold time. ND results were "Rejected". Since original results were used for data quality interpretation. JK

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

SDG No.: SAII13
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. 3.6°C – 5.2°C
only waste samples, other results in different SDGs.

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	7/1,2/02	7/16,19/02	—
Hg	7/1,2/02	7/17,23/02	—

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 initial 132%.
Pb initial 78%
Tl initial 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: Tl results → UJ, p. see attached.

Other results > 5X blank conc. JK

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: Summary form was not provided

Ca conc in two sample > ½ of ICSAB conc. → WASTE-0-3-comp, WASTE-0-2-comp

Fe conc in several sample > ½ of ICSAB conc. J, n → Cd

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 -

Hg RPD = 40.8% → ~~Since sample~~ J, d.

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)		✓					✓					
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

	%R > 125% (120%)	30% < %R < 74% (79%)	%R < 30%
Positive	J	J	J
Non-detect	None	UJ	R

Note: MS/MSD - non-client sample.

Sb MS = 67%, MSD = 67%. Mn MS = 39%, MSD = 64%.

Cu MS = 187%, MSD = 146%. Hg ~~MSD = 0%~~) Since sample result > 4 x spiking conc ok.

Mg MS = 134%, MSD = 175% Hg ~~MS = 195%~~)

(*) All post-digestion spike → 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 - Waste-0-1-COMP. 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:
SDG No.: SA II 14

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. 3.6°C - 5.9°C

(*) Missing COC for samples GW-AA-0-2-12ef and GW-AA-P-1-44FT → In SVOC fraction, ok

(JA) VOC analysis was not requested on the COC - added per steve

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.
7/8/02	7/11/02	3 days
7/9/02	7/11-12/02	2-3 days

3.0 GC/MS Instrument Performance Check (IPC)

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

Note: 5/21/02 0848. I. Cal.
7/11/02 0902. } field samples
7/12/02 1036.

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- 1P0711 MB All NDs.
MB- 1P0712MB All NDs.

TB-070802-02 All NDs.

TB (Line Number 11) All NDs
(7A) ~~TB (Line~~ Trip Blank-1 (Line Number 4). 1,1-Dichloroethane 0.44 ug/L, Methylene chloride 0.39 ug/L, Toluene 0.38 ug/L, Ethyl benzene 0.20 ug/L.
Trip Blank-2 (Line Number 5) 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: J. Cal. 5/21/02 All %RSDs or r^2 were in control.
All RRFs ≥ 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. 7/11/02 1004 chloromethane 28.7%, Bromomethane -26.7%, dibromofluoromethane 30.3%.
7/12/02 1050. All %Ds < 20%. RRFs > 0.05 [illegible]

⊗ chloromethane J,C in GW-AA-0-2-124, GW-AA-P-1-24FT-DUP, and GW-AA-0-1-66.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

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

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

Note:

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

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

Note: MS/MSD - GW-AA-P-1-64FT

2-butanone MSD = 180% ↑ (42-167%)
RPD = 68% (< 31%).

1). only GW-AA-P-1-24FT-Dup had positive detection, but <RL.
2). MS %R was OK.

All other %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- 1P0711MB - All %Rs were in control.

LCS- 1P0712MB - Bromomethane 32%, ↓ (40-141%) Acetone 180% ↑ (32-174%)

→ GW-AA-0-1-86. Bromomethane → R, I
Acetone → ND, ok.

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note: GW-AA-0-2-12ft. mass spectrum for chloromethane and vinyl chloride has some inference, but accept lab decision. (RRT is OK).

12.0 TCL/TIC Quantitation and Reported Detection limits

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

Note: chlorobenzene exceeded the linear range in samples GW-AA-0-1-96 (DF=20) and GW-AA-01-86 (DF=5). → no original data were reported, RLs were raised.

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-P-1-24FT	GW-AA-P-1-24FT-Dup.	RPD/Difference	RL
Acetone	(JA) ~~1.0 UB~~ 29 ug/L	29 ug/L		
Chloroform	(JA) ~~2~~ 1.0 U	0.33 ug/L	0.33 ug/L	1.0
2-butanone	10 U	7.5 ug/L	7.5 ug/L	10

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: 17

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 = 99.8%

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:
SDG No.: SAII 14

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.: 3.6°C - 5.9°C

~~Missing COC for Sample GW-AA-0-2-124. a~~ JA

Sample GW-AA-P-1-44FT was requested for SVOC analysis, but was not logged-in.

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.
	7/8/02	7/15/02	7 days	7/23-24/02	8-9 days.
	7/9/02.	7/15/02	6 days. / JA	7/24, 26/02	9, 11 days.
GW-AA-0-2-124	7/8/02	7/25/02	17 days	7/26/02	1 days.

JA | R.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: 7/20/02 1909 - I. Cal, 7/22/02 1821 I. Cal,
MS 65973 7/23/02 1738, 7/24/02 0841, 7/26/02 0052 → field samples
7/26/02 1601 → GW-GA-072-124 RE
7/28/02 0721 — 0725 LCS
7/29/02 0802 — 0725 LCSD.

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 - 0715F - GMB. All ND's.

MB - 0725D - GMB 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 7/20/02, 7/22/02) All %RSDs or r^2 were in control. RRF >0.05

→ C. Cal. 7/26/02 1420 2,4-dinitrophenol -25.6%, Benzo(k)fluoranthene (33.3%), Indeno(1,2,3-cd)pyrene 25.8%
7/28/02 0736 Bis(2-chloroethyl)ether 22.9%.
7/29/02 0817. Bis(2-chloroethyl)ether 22.8%, 2,4-dinitrophenol 24.9%, 4,6-dinitro-2-methylphenol 23.1%, Benzo(k)fluoranthene 21.2% Indeno(123-cd)pyrene 21.1%, Benzo(g,h,i)perylene 21.8%

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 1754, 7/23/02 1823 All %Ds <20%. RRF >0.05
7/24/02 0856 Bis(2-chloroethyl)ether -21.9%, bis(2-chloroisopropyl)ether 21.4% N-nitroso-di-n-propylamine 27.9% 2,4-dinitrophenol 24.9% 4-nitrophenol 24.3%, 4,6-dinitro-2-methylphenol 27.6%.
7/26/02 0107 Bis(2-chloroethyl)ether 25.5%, bis(2-chloroisopropyl)ether 25.4%, Isophorone 20.7% N-nitroso-di-n-propylamine 31.1%, 2-nitroaniline 27.7%, 2,4-dinitrophenol 26.8% 4-nitrophenol 37.2%, 4-nitroaniline 20.7%, 4,6-dinitro-2-methylphenol 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? 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-0-2-124 Nitrobenzene-d5 30% ↓ (34-130%). 2-Fluorobiphenyl 26% ↓ (36-124%). 1) Sample was re-extracted exceed the hold time → J/R 2) Surrogate recoveries were in control.

J/UJ – All base/neutral results.

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

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

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

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

Note:

MS/MSD – GW-AA-P-1-64FT ⊛ This MS/MSD pair was reanalyzed - results see attached.

Hexachlorobenzene	MS = 39% ↓	MSD = 47% ↓	(49-121%)	Acenaphthylene
3,3'-dichlorobenzidine	MS = 7% ↓	MSD = 5% ↓	(10-144%).	MS = 28%
Bis(2-chloroisopropyl)ether		RPD = 24%	(< 23%)	MSD = 28%
Nitrobenzene		RPD = 23%	(< 21%)	(41-121%)
Bis(2-chloroethoxy)methane		RPD = 21%	(< 20%).	

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-0715F-GMB. → All %Rs were in control.
LCS-0725D-GMB → LCS/LCSD All %Rs and RPDs were in control.

10. Internal Standards

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

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

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

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

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

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

Note:

11.0 TCL Identification

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

Note: GW-AA-P-1-74FT. ~~pt~~ (A) pentachlorophenol. / M.

GW-AA-O-1-66 1,2-dichlorobenzene / M

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-P-1-24FT GW-AA-P-1-24FT-DUP.

SVOCs 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: 12

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: GW-AA-0-2-12 RE - 63 non-detects were rejected due to holding time violation. Since original results are still usable, OK

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.: SAII14

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: 3.6°C - 5.9°C.

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times 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.
7/8, 9/02	7/15/02	6-7 days	7/17/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

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

Note: MB-071SO-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 7/15/02 All %RSDs < 20%.
SGJBCD

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:

7/15/02 1153. All %Ds <15%

7/17/02 0928
7/17/02 1521) All %Ds <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 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 7/17/02 1001 RTX-CLP Endosulfan sulfate 24.5%.
Methoxychlor 16.7%.
RTX-CLP2 All %Ds < 15%.
7/17/02 1545 RTX-CLP (A) ~~TCLP~~ TCMX -15.7%
DCBP 16.6%
44847-1,2,3 → RTX-CLP2 (A) ~~TCLP~~ TCMX -16.2%
44884-1,2 7/17/02 2146 RTX-CLP Endosulfan sulfate 22.4% → J/UJ
Methoxychlor 18.3%
TCMX -16.2%
RTX-CLP2 Endosulfan sulfate 15.6%, TCMX -18.3%.

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

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

Note: GW-AA-O-2-124 DCBP 15%/14% (30-150%)
GW-AA-P-1-24FT-Dup TCMX 20%/20% (30-150%), 2,4-DCAA 28%

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

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

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

8.4 Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification. [ ] ✓

Note: MS/MSD - GW-AA-P-1-64FT
→ beta-BHC RPD=42%, γ-chlordane RPD=26%, α-chlordane RPD=26%, 4,4'-DDE RPD=22%
→ delta-BHC MS=140%, MSD=180%, Endrin aldehyde MS=130%, MSD=155%.
gamma-chlordane MSD=130%, alpha-BHC MSD=130%, 4,4'-DDT MSD=160%.

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 - 07150 - 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-0-2-124 alpha-BHC 161.1% → J,s previously, ok
GW-AA-P-1-64FT Heptachlor. 70.8% → J,g
⊛ lower results were reported.

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-P-1-24FT GW-AA-P-1-24FT-DUP
Pesticide All NDs All NDs

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: 4
13.1.2 Number of target compounds in each analysis: 21
13.1.3 Number of results rejected and/or not reported: 0
% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)
% 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.: SAII 14

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: 3.6°C - 5.9°C

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted.	H.T.	Date Analyzed.	H.T.
7/8,9/02	7/15/02	6,7 days	7/23/02	8 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	[✓]		
3.2	Have all samples been analyzed within twelve hours of the tune? If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".	[✓]		
3.3	Have ion abundance criteria for DFTPP been met for each instrument used? If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".	[✓]		

Note: 7/22/02 0720 – I. Cal
7/22/02 0529 – 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 - 0715I - KMB All D/Ds

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. 7/22/02 All %RSDs <15%. RRF >0.05

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note: C. Cal 7/23/02 0632) 7/23/02 1407) All %Ds < 20%. RRF >0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]		✓

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

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-8A-P-1-64FT

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 - 0715I-KMB LCS. All %Rs were in control

10. Internal Standards

		Yes	No	NA
10.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?	[✓]		

	Area > 130%	Area < 70%
Positive	J	J
Non-detect	None	UJ

If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).

10.2 Are retention times of internal standards within ± 12 seconds of the associated calibration standard? [✓]

Action: The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not need to be qualified as "R" if the mass spectral criteria are met.

10.3 Were any transcription/calculation errors noted in the internal standard data? Level IV only - 5% verification. [ ] ✓

Note:

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-P-1-24FT	GW-AA-P-1-24FT-DUP.	Difference	RL
Monochlorodiphenyl	0.04	0.05	0.01 ug/L	0.1
Nonachlorodiphenyl	0.10	0.50U	0.1 ug/L	0.5

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.: SAII14

1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	[✓]		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	[✓]		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		[✓]	
1.4	Do sample preservation, collection and storage condition meet method requirement? If samples were not ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	[✓]		

Note: Cooler temp: 3.6°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	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.
	7/8, 9/02	7/15/02	6.7 days	7/24/02	9 days.
GWBAP-1-24FT re-extracted re-analyzed	7/8/02	7/30/02	22 days → J/R	8/2/02	3 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze herbicide samples and each extraction batch?	[✓]		
3.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.3	Do any method/instrument/reagent blanks have positive results? Apply the 5 x rule per the National Functional Guidelines	✓	[ ]	
3.4	Do any field/rinse/equipment blanks have positive results? If Yes, use same rules above.		[ ]	✓
3.5	Are there field/rinse/equipment blanks associated with every sample? If No, noted in the DV report.	[ ]		✓
3.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 0715N - SMB (7) ~~Beta~~ Pentachlorophenol 0.34 ug/L $\xrightarrow{x5}$ 1.7 ug/L
MB - 0730P - SMW. 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 7/22/02 All %RSDs or r^2 were in control.
C. Cal. 8/2/02 2307 DB-XLB MCPP 18.9%, 2,4-D 15.7%
DB-35MS 2,4-DB -16.9%

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. 7/24/02 0142 ← field samples
7/24/02 1227
GW-18A-P-1-24RE → 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%, Pentachlorophenol 15.5%
DB-35MS 2,4-DB -15.2% ≈15% OK

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[✓]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - ~~MW~~ (TA) GW-SA-P-1-64FT 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- 0715N-SMB All %Rs were in control.
LCS- 0730P-SMB Pentachlorophenol 190%. → J.h in associated sample
no additional Flags

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: GW-AA-0-2-124 2,4,5-TP 57.6%. → J,g

GW-AA-P-1-64FT Dichlorprop 132.3%. 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-P-1-24FT	GW-AA-P-1-24FT-DUP.	Difference	RL
2,4-D	0.80	0.50 U.	0.80	0.5
Pentachlorophenol	1.8	1.0 U,z.	1.80	1.0
2,4,5-T	0.22	0.50 U	0.22	0.5

NC
<2XRL

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: (*) PCP was detected at 0.34 ug/L in the MB. Since PCP was detected above the R.L in sample GW-AA-P-1-24FT. This sample was re-extracted. (grossly exceeded the H.T) All results were J or R. Since original results still can be used for data interpretation. JK

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAII14
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: 3.6°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	7/8,9/02	8/2/02	24,25 days
Hg	7/8,9/02	7/25/02	16,17 days

3.0 Method Detection Limits (MDL)

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are all MDL equal to or less than the reporting limits specified?	✓						✓					
3.2	Were all results and detection limits for solid matrix samples reported on a dry-weight basis? All aqueous samples.			✓						✓			
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 = 0.999934

Note: CRDL
- Al final 124%↑, Se initial 127%↑ final 145%↑ Na initial 74%↓ final 66%↓ previously flagged due to MB contaminant
  Tl initial 73%↓.
  ↳ ~~J.W.~~ (JA) ~~GW-AA-0-2-124.~~
- Tl initial 134%
- Al final 136%↑, initial 124%↑, Na final 69%↓ Tl initial 73%↓ final 78%↓

5.0 Blanks

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓						✓					
5.2	Are there reported PB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓						✓				
5.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.4	Were continuing calibration blanks (CCB) analyzed at the correct frequency (after every 10 samples or every 2 hours whichever is more frequent)? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	✓						✓					
5.5	Are there reported ICB or CCB values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	✓						✓					

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	✓							✓				
5.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	✓							✓				
5.8	Are there reported field blank or equipment blank values > ± MDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.			✓						✓			
5.9	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.			✓						✓			

Note: Hg, CCB2 0.126 ug/L → Since no field sample associated with this CCB, OK

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 for GW-AA-P-1-64FT. All %RPDs were in control

Also LCS/LCSD.

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)		✓					✓					
	%R > 125% (120%) / 30% < %R < 74% (79%) / %R < 30%												
	Positive: J / J / J												
	Non-detect: None / UJ / R												
9.4	Were any transcription/calculation errors noted in the MS and post-digestion spike data? Level IV only.			✓						✓			

Note: MS/MSD - GW-AA-P-1-64FT Potassium MS=126%, MSD=126% J.m

Post-digestion Spike - GW-AA-P-1-24FT, GW-AA-P-1-64FT 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: GW-AA-P-1-24FT, GW-AA-P-1-64FT 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:

	P-1-24FT	P-1-24FT-DUP.	RL		P-1-24FT	P-1-24FT-Dup	RL
Al	0.049	0.055	0.20	Na	0.078	0.0099	0.04
Ba	0.12	0.12		K	46	48	1.0
Ca	230	230.		Na	17	18	0.5
Cu	0.0016	0.0012	0.02	V	0.010U	0.0017	0.01
Fe	2.1	2.1		Zn	0.0032	0.020U	0.02
Mg	31	32	0.5				
Mn	0.033	0.027	0.01				

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:												
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:
Laboratory: STL-Savannah
SDG No.: SAII14
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. 3.6°C - 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.	H.T.
7/8,9/02.	7/17/02	8-9 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal. 6/12/02 $r^2 = 0.987$ J, r
C. Cal 7/17/02 0747, Methane %D = 22.8%.

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 - 1C0717MB. 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-BA-P-1-64FT.
Methane MS = 86%, MSD = 108% (75-125%)
RPD = 18% (<30%)

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only LCS	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?			✓

Notes: LCS - 1C0717MB1LCS 78% (75-125%)

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

See MS/MSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.	✓		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.		✓	

Notes:

	GW-AA-P-1-24FT	GW-AA-P-1-24FT-DUP.	Difference	RL
Methane	0.40 ug/L	0.29 ug/L	0.11 ug/L <RL	0.19 ug/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: 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.: SAII14
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.: 3.6°C - 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.	H.T.
7/8/02	7/20/02	12 days
7/9/02	7/23/02	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 <1.0 mg/L
PBW-2 <1.0 mg/L.

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 - 104% (7/20/02)
LCS - 94% (7/23/02).

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 - GW-AA-P-1-24FT 541.0/493.9 mg/L RPD=9.1%. 7/20/02
Lab dup - GW-AA-O-1-96. 729.1/709.5 RPD=2.7% 7/23/02

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-P-1-24FT	P-1-24FT-Dup	RPD
Alkalinity	540 (541.0)	610. (607.6)	12.2%

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:

All samples were diluted by a factor of 5 due to high calcium carbonate.

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.: SAII14
Test Name: Nitrate-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. 3.6°C - 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.	H.T.
7/8/02	7/10/02	2 days
7/9/02	7/11/02	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: I. Cal. 5/22/02 (7/9/02, modified) r = 0.9998. /JK
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.	✓	~~✓~~	JA
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 - PBW-1 (as CCB-1) JA ~~AFD~~ 0.0177 mg/L ICB/CCB — All ND's
MB — PBW-2 (as CCB-4) ND → Since NO_3-N was not detected in associated samples, ok

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? JA	~~✓~~	✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓		
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?			✓
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD - GW-AA-P-1-6dFT
NO_3-N MS = 36% ↓, MSD = 39% ↓ UJ.m / J.m
RPD = 2.4%, /JK

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present? only	✓		
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: 7/10/02 LCS/LCSD 87%/85%.
7/11/02 LCS/LCSD 86%/84%.

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 - not from client sample, also see MS/MSD, LCS/LCSD

7/10/02 S 244815-3 /Dup. All NDs.
~~7/11/02~~

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-HA-P-1-24FT GW-HA-P-1-24FT-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: 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.: SA II 14
Test Name: 804
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. 3.6°C - 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. H.T.

7/8,9/02 7/16/02 7,8 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal. 5/29/10 $r^2 = 0.9989$.
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 - 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-P-1-64FT
SO4 MS = 88% MSD = 94%
RPD = 0.99%

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 - 804 = 116%/ok

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:

	GW-BA-P-1-24FT	GW-BA-P-1-24FT Dup.	RPD
804	180	170	5.7%/ok

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-1A-0-2-124 20X Dilution
All others 10X 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: 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 - 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.: SA II 15

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.

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.
7/10/02	7/17/02	7 days
7/11/02.	7/17/02	6 days

3.0 GC/MS Instrument Performance Check (IPC)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for 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: 5/21/02 1848 I. Cal.

7/17/02 0713. field samples

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC) for SVOAs?		[✓]	
4.4	Do any field/trip rinse/equipment blanks have positive VOA results (TCL, and/or TIC)?	✓	[ ]	
4.5	Are there field/trip/rinse/equipment blanks associated with every sample?	[✓]		
	Apply the 5X or 10X (for common contaminants - CH_2Cl_2, acetone, and 2-butanone) rule per the National Functional Guidelines			
4.6	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB-1 P0717MB All NDs

GW-AA-P-1-120FT. 4,4 at RL

TB-071002-02 Methylene chloride 0.32 ug/L, All ND Toluene 0.76 ug/L, > 5X conc. chlorobenzene 0.62 ug/L

TB-071002 (16:00) chloromethane 0.56 ug/L Trichloroethene 0.52 ug/L.

↳ GW-AA-0-1-120 4,4 at RL

TB-071002 (1300). 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 (MSP5973) 5/21/02 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. 7/17/02 0734 Bromomethane %D = -23.2%. RRF > 0.05

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[✓]		
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[✓]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]	✓	

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: MS/MSD - GW-AA-P-1-94FT.

Bromomethane RPD=60% (<33%)

Since MS/MSD recoveries were in control, ok

9.0 Laboratory Control Sample (LCS)

		Yes	No	NA
9.1	Is an LCS recovery form present?	[✓]		
9.2	Is LCS analyzed at the required frequency for each matrix?	[✓]		
9.3	Are all LCS %Rs within acceptance criteria?	[✓]		

	> UCL	< LCL
Positive	J	J
Non-detect	None	R

		Yes	No	NA
9.4	Were any transcription/calculation errors noted in the LCS data? Level IV only - 5% verification.		[ ]	✓

Note: LCS - IP0717MB. 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).

		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: Chlorobenzene conc. in GW-SA-P-1-120FT (DF=10) exceeded the linear range — see dilution.

13.0 Field Duplicate Samples

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	[✓]		
13.2	Were there any positive results detected in both samples? (If Yes, calculate RPD for both results greater than RL)	[ ]	✓	
13.3	Were all RPD or absolute difference values within the control limits? If No, J(+)/UJ(-) or professional judgement.	[✓]		
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			

Note:

	GW-SA-S-1-54	GW-SA-S-1-54 DUP.	Difference	RL
Chloromethane	1.0 U	0.32 ug/L	0.32 /	1.0
2-butanone	10 U	11 ug/L	11 /	10
Chlorobenzene	1.0 U	0.44 ug/L	0.44 /	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: 14

14.1.2 Number of target compounds in each analysis: _____

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%.

Note: _____

DATA VALIDATION WORKSHEET - Level III/IV Review
SEMIVOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII15

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

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.
7/10/02	7/16/02	6 days	7/30, 31/02	14, 15 days
7/11/02	7/16, 19/02	5, 8 days	7/31/02	15, 12 days
GW-AA-S-154-Dup 7/11/02 re-extracted re-analyzed.	8/1/02	21 days → All R.h	8/5/02	4 days → GW-AA-S-1-54-Dup. "UJ.h" "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: 7/20/02 1909. I. Cal. 7/22/02 1821 I. Cal 8/2/02 1645. I. Cal.
7/26/02 0052 QC samples.
7/29/02 2055, 7/31/02 0731, – ~~two~~ field samples.
8/5/02 0907. one re-extracted sample.

4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each matrix, each GC/MS system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
4.2	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
4.3	Do any method/instrument/reagent blanks have positive results (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 - 0216G-GMB All NDs

MB - 0801C - 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: I Cal. 7/20/02, 7/22/02) All %RSDs or r^2 were in control.
7/31/02 2,4-dinitrophenol r^2=0.887 (*) UJ,r, except GW-18A-S-1-540 "UJ,h"
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. 7/26/02 0107: Bis(2-chloroethyl)ether 25.5%, Bis(2-chloro ~~isopropyl~~ isopropyl)ether 25.4%
(7/26/02 0134) n-nitroso-di-n-propylamine 31.1%, Isophorone 20.7%, 2-nitroaniline 27.7%
2,4-dinitrophenol 26.8%, 4-nitrophenol 37.2%, 4-nitroaniline 20.7%
4,6-dinitro-2-methylphenol 20.7%.
7/29/02 2132. All %Ds < 20%.
(7/29/02 2206)
7/31/02 1103 All %Ds < 20%
8/5/02 1015 2,4-dinitrophenol -33.3%, 4,6-dinitro-2-methylphenol -26.0%.

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Note that acids and base/neutrals are assessed separately.	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[✓]		
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.	[ ]	✓	

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note: — GW-AA-S-1-54 Dup · 2-Fluorophenol 24% ↓ (29-121%) Since all results were flagged J/UJ due to hold time violation, recovery
Nitrobenzene-d5 24% ↓ (34-130%)
2-Fluorobiphenyl 26% ↓ (36-124%)
(*) This sample was re-extracted and re-analyzed, and displayed acceptable surrogate
— GW-AA-P-1-12WFT Phenol-d5 24% ↓ (25-128%) only one surrogate 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 - 45366-7.
3,3-dichlorobenzidine MS = 2% MSD = 0% (10-144%).
Nitrobenzene MSD = 48% (50 - 111%)
Several 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? Several RPDs were out!	[✓]		

	> 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 - 0716G-GMB. 1,3-dichlorobenzene RPD=35%, Bis(2-chloroethoxy)methane 25% RPD
2-chloronaphthalene RPD=27%, Dibenzofuran RPD=26%
Fluorene RPD=24%, 4-chlorophenyl-phenylether RPD=29%
Benzo(b)fluoranthene RPD=35%.
LCS - 0801C-ZMB 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: Several Mass spectrum had matrix interference. (
special for trace level compounds.

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: ⊛ Samples GW-AA-P-1-104FT and GW-AA-S-1-44 — use 500ml sample volume (1/2) for extraction - therefore, RLs were raised by a factor of 2.

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-S-1-54	GW-AA-S-1-54-DUP	Difference	RL
Bis(2-ethylhexyl)phthalate	10 U	3.5 ug/L	3.5	10
All 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: 10

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:
SDG No.: SAII/5

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. 1.2°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(-).		[✓]	
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.
7/10/02	7/15/02	5 days	7/17/02	2 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze volatile samples and each extraction batch (medium level soil)?	[✓]		
3.2	Has a method blank been analyzed at least once every 12 hours for each GC instrument used?	[✓]		
3.3	Has a method blank been analyzed for each set of samples or every 20 samples of similar matrix, (water, low soil, medium soil) whichever is more frequent?	[✓]		
3.4	Do any method/instrument/reagent blanks have positive results?		[✓]	
3.5	Do any field/rinse/equipment blanks have positive results?		[✓]	
3.6	Are there field/rinse/equipment blanks associated with every sample? Apply the 5X rule per the National Functional Guidelines	[ ]	[ ]	✓
3.7	Were any transcription/calculation errors noted in the method blank or field blank data? Level IV only.		[ ]	✓

Note: MB - 07150 - 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. 7/15/02 All %RSDs < 20%.

5.0 GC/ECD Instrument Performance Check

		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	[ ]		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	[ ]		✓
	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to determine the need to qualify data as unusable (R).			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.	[ ]		✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?	[ ]		✓
5.5	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	[ ]		✓
5.6	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).	[ ]		✓
5.7	Has the 4,4'-DDT percent breakdown less than or equal to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	[ ]		✓
5.8	Has the endrin percent breakdown less than or equal to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	[✓]		
5.9	Has the combined 4,4'-DDT and endrin percent breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	[✓]		
		[✓]		

Note: 7/15/02 1153 } All DDT and endrin %Breakdown < 15% JK
7/17/02 0928
7/17/02 1521

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. 7/17/02 1001 Endosulfan sulfate 24.5%, Methoxychlor 16.7% RTX-CLP

7/17/02 1545 RTX-CLP TCMX -15.7%, DCBP -16.6%

RTX-CLP2 TCMX -16.2%.

44926-1 → -2 -3.

7/17/02 2146 RTX-CLP Endosulfan sulfate 22.4%, Methoxychlor 18.3%.

TCMX -16.2%

RTX-CLP2. Endosulfan sulfate 15.6% TCMX -18.3%.

Endosulfan sulfate → UJ,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

7.5 Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification. [ ] ✓

Note:

GW-AA-P-1-104FT TCMX confirmation column 26%. ↓ (30-150%)

only one out, ok

GW-AA-O-1-120 DCBP 18%/20% ↓ (30-150%) 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 - 44884-2 Outliers 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 - 07150-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-P-1-104FT α-chlordane RPD=118.2%
GW-AA-P-1-120FT α-chlordane RPD=125.4%
GW-AA-O-1-120 α-BHC RPD=153.2%.

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:

13.0 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: 3

13.1.2 Number of target compounds in each analysis: 21

13.1.3 Number of results rejected and/or not reported: 0

% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)

% 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.: SAII15

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

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.
7/10/02	7/15/02	5days	7/23/02	8days

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 0722 I. Cal.

7/23/02 0529 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 - 0715I-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 7/22/02 All %RSDs <15%.

6.0 Continuing Calibration

		Yes	No	NA
6.1	Are Continuing Calibration summary forms present and complete for each instrument used?	[✓]		
6.2	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	[✓]		
6.3	Do any compounds have a % drift (%D) values between initial and continuing calibration RRF outside QC limits (%D < 20% for aqueous and %D < 30% for soil)? If yes, J(+)/UJ(-) or professional judgement.		[✓]	
6.4	Do any continuing standard compounds have a RRF < 0.05? If yes, J(+)/R(-) or professional judgement.		[✓]	
6.5	Were any transcription/calculation errors noted in the continuing calibration data? Level IV only - 5% verification.		[ ]	✓

Note:

C. Cal 7/23/02 0632 All %Ds < 20%
7/23/02 1407

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-P-1-64FT.
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 - 0715-I-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: 3

14.1.2 Number of target compounds in each analysis: 10

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
HERBICIDES ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII 15

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

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.
7/10/02	7/17/02	7 days	7/24/02	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: MB - 0717W-SMB. 2,4-D 0.39 ug/L, Pentachlorophenol 0.64 ug/L 2,4,5-T 0.16 ug/L
All 2,4-D and 2,4,5-T → U,z or U,z at RL.
All PCP conc in associated samples, > 5X blank conc, no action was taken.

4.0 Initial Calibration

		Yes	No	NA
4.1	Are Initial Calibration Summary Forms present and complete for each instrument used?	[✓]		
4.2	Are sufficient standards included in the calibration curve?	[✓]		
4.3	Are response factors stable (%RSD values < 20% or r > 0.995) over the concentration range of the calibration? Linear No Flags, Nonlinear J(+)/UJ(-).	[✓]		
4.4	Were any transcription/calculation errors noted in the initial calibration data? Level IV only - 5% verification.		[ ]	✓

Note: I. Cal 7/22-23/02 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 7/24/02 2056 All %Ds < 15%
7/25/02 0743 Pentachlorophenol 16.9%, ~~2,4,5-T 15.1%~~ OK DB-XLB
DB-35MS — All %Ds < 15%.
⊗ Positive PCPs J,c

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[✓]		
6.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]		✓
6.4	If No in Section 7.3, is any sample dilution factor greater than 10?. (Surrogate recoveries may be diluted out.)	[ ]		✓

Note: If SMC recoveries do not meet acceptable criteria for SMCs in samples chosen for the MS/MSD and diluted samples, then no reanalysis is required.

%R	> UCL	10% to LCL	< 10%
	J(+)	J(+)/UJ(-)	J(+)/R(-)

6.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5	Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification.		[ ]	✓

Note: See LCS/LCSD

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 - 0717N-SMB. All %Rs and RPDs were in control

9.0 TCL Identification

		Yes	No	NA
9.1	Perform a cursory review of sample raw data. Note any significant observations using the following guidance for identification cirteria.			
9.2	Does the retention time (RT) of each reported compound fall within the RT window from the daily calibration?	[✓]		
9.3	Is there evidence of unreported peaks (use professional judgement; benefit of doubt goes to the analyst)?		[✓]	

Note:

10.0 TCL Quantitation and Reported Detection limits

		Yes	No	NA
10.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
10.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
10.3	For positive detections, are all positive detections were confirmed in second column? Apply J flag if RPD > 40% between first and second columns.	[✓]		
10.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[ ]	✓	
10.5	Were any transcription/calculation errors noted in the TCL data? Level IV only - 5% verification.		[ ]	✓

Note: For all positive detection, RPDs < 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: 3

12.1.2 Number of target compounds in each analysis: 10

12.1.3 Number of results rejected and/or not reported: 0

% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
INORGANIC - ICP, GFAA, CVAA, and Cyanide - for RCRA

SDG No.: SAII15
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

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	7/10/02	8/2/02	23 days
Hg	7/10/02	7/26/02	16 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%

Hg r = 0.999750 / ✓

Note: CRDL

Al initial 135% ↑.
Fe Final 69% ↓.
Se Final 72% ↓.
Tl initial 68% ↓
Na Final 69% ↓.

Hg 70%

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: CCB2 Hg -0.077 ug/L → No field samples associated with this CCB

NL

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 %RSD~~ 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 - GW-AA-P-1-104FT. All %Rs and RPDs were in control.

Post-digestion Spike - All %Rs were in control

10.0 ICP Serial Dilutions

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓											
10.2	Was a five-fold dilution performed?	✓											
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the ~~IDL~~ MDL in the original sample? If no, J(+).	✓											
10.4	Were any transcription/calculation errors noted in the serial dilution data? Level IV only.			✓									

Note: Serial dilution - GW-AA-P-1-104FT.

Serial Dilution GW-AA-O-1-120 for Na only

11.0 Field Duplicate Samples

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓						✓			
11.2	Were there any positive results detected in both samples? (If Yes, calculate RPD or difference for both results greater than RL)			✓						✓			
11.3	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓						✓			
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.												

Note:

12.0 Data Completeness

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Is % completeness within the control limit? (Control limit: 95% for aqueous samples and 90% for soil samples)	✓						✓					
12.1.1	Number of samples: 3												
12.1.2	Number of target compounds in each analysis:												
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: Sunset Area II
Project Number:
Laboratory: STL-Savannah
SDG No.: SAII15
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 1.2°C - 5.7°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

Date Collected	Date Analyzed	H.T.
7/10/02	7/16/02	6 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?		✓	
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 6/12/02 $r^2 = 0.987$. J.r.
C. Cal 7/15/02 1007 %D <15%

4.0 Blanks (Laboratory and Field)

		Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		✓	
4.3	Were there any transcription/calculation errors in blank data?		✓	
4.4	Do any field equipment blanks/trip blanks have positive results?			✓
4.5	Are there field equipment blank/trip blanks associated with every sample?			✓

Notes: MB - 1C0715MB Methane 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:

See LCS/LCSD

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.5	Were there any transcription /calculation errors?			✓

Notes: LCS/LCSD

Methane LCS = 76%. (75-125%)
LCSD = 91%
RPD = 18% (<25%)

7.0 Laboratory Duplicate

		Yes	No	NA
7.1	Were laboratory duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
7.2	Was a field blank used for duplicate analysis? If yes, use professional judgement to determine the effect on the data and note in reviewer narrative.			✓
7.3	Are all analyte duplicate results within control limits?			✓
7.4	Were there any transcription /calculation errors?			✓

Notes:

See LCS/LCSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

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:
X NFG/SW-846
___ NJDEP/SW-846
___ NFG/CLP
X Project QAPP/SAP
___ Region III/SW-846

Project Name: Sauget Area II
Project Number:
Laboratory: STL-Savannah
SDG No.: SAII15
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: 1.2°C - 5.7°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed	H.T.
7/10/02	7/23/02	13 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 mg/L)

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? only LCS	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? only LCS			✓
6.5	Were there any transcription /calculation errors?		✓	

Notes:

LCSW-1 Alkalinity 94% 2336.3/2500 =

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:

4884-1 Alkalinity 729.1 mg/L / 709.5 mg/L

RPD=2.7% /ok

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 samples were analyzed at 1:5 dilutions due to high calcium carbonate 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:
X NFG/SW-846
___ NJDEP/SW-846
___ NFG/CLP
X Project QAPP/SAP
___ Region III/SW-846

Project Name: Sauget Area II
Project Number:
Laboratory: STL-Savannah
SDG No.: SAII15
Test Name: Nitrate-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 1.2°C - 5.7°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes:

Date Collected	Date Analyzed	H.T
7/10/02	7/12/02	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.		✓	~~✓~~ JA

Notes: I. Cal 5/22/02 / 7/11/02 r = 0.9998 / ok for Nitrite 7/10/02 r = 0.9998 for Nitrate
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 (CCB-1).
ICB/CCBs All NDs.

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Was a field blank used for MS/MSD analyses?		✓	
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	✓	~~✓~~	JA
5.5	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits?	~~✓~~ JA	~~✓~~ ✓	
5.6	Were there any transcription /calculation errors?		✓	

Notes: MS/MSD - 4884-2 (GW-AA-P-1-64FT)

"UJ,M" MS = 36% / ok (0.250 - 0.179)/0.20 = 0.071/0.2 = 35.5%
MSD = 39% / ok (0.256 - 0.179) 0.20 = 0.077/0.2 = 38.5%
RPD = 2.4%.

6.0 Laboratory Control Sample/Laboratory Copntrol Sample Duplicate (LCS/LCSD)

		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits?		✓	
6.5	Were there any transcription /calculation errors?		✓	

Notes: LCS/LCSD

NO_3-N LCS = 86 %

LCSD = 82 %.

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 – S244949-1

NO_3-N 0.146 mg/L / 0.148 mg/L RPD = 1.2%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?	✓		
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			✓
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 3			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%.			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET
Conventional Analysis

Reviewer: JA
Date:
DV Level: II (III) IV
Review Document:
X NFG/SW-846
___ NJDEP/SW-846
___ NFG/CLP
X Project QAPP/SAP
___ Region III/SW-846

Project Name: Sauget Area II
Project Number:
Laboratory: STL – Savannah
SDG No.: SAII15
Test Name: Sulfate
Method No.: 375.4

1.0 General: Chain-of-Custody/Data Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Does sample preservation, collection and storage meet method requirement?	✓		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓		
1.6	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:
Cooler temp: 1.2°C – 5.7°C

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

Date Collected	Date Analyzed.	H.T
7/10/07.	7/16/07	6 days

3.0 Instrument Calibration

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
3.2	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
2.3	Was continuing calibration verification (CCV) analyzed every 10 field samples or every 2 hours, whichever is more frequent? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	✓		
2.4	Are all calibration standard (ICV and CCV) percent recoveries within the control limits?	✓		
2.5	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			✓

Notes: I. Cal 5/29/12 $r^2 = 0.9989$.
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 (CCB-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 - 4884-2 (GW-AA-P-1-64FT)
MS = 88% / ~~87.6%~~ (201.338 - 183.813) / 20 = 87.57%
MSD = 94%
RPD = ~~[illegible]~~ 0.59%
JA

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-1 116%
LCSW-2 113%

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 4992-2 453.815 mg/L / 465.463 mg/L RPD = 2.5%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
8.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgement.			✓
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100% RPD for soil samples will be used. For soil/aqueous sample results < 5 x CRDL (or RL), a control limit of 2 x CRDL (or RL) will be used.			✓

Notes:

9.0 Sample Results/Detection Limit Verification

		Yes	No	NA
9.1	Are all sample results within the calibrated range?		✓	
9.2	If samples are not within the calibrated range, were they diluted and reanalyzed or was a high-level check standard analyzed? If not, contact laboratory. Request reanalysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.	✓		
9.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		
9.4	Were there any transcription /calculation errors?		✓	

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%)	✓		
10.1.1	Nunber of samples: 3			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

11.0 Surrogate Recovery

		Yes	No	NA
11.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓
11.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓
11.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?			✓
11.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			✓

Notes:

DATA VALIDATION WORKSHEET - 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.: SAII16

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.

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.	
	7/10/02	7/15,16/02	5, 6 days.	
	7/11/02	7/16,22,25/02	5, 11, 14 days	~~JA J.h~~
⊛ 44926A-3RE	7/10/02	7/26/02	16 days.	→ J/UJ → ~~Toluene only~~.
	7/12/02	7/10,22,25/02	4, 10, 13 days	~~JA others not used for~~ [illegible]

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 7/11/02 0857 I.Cal
MS05973 – 7/15/02 1945, 7/22/02 0853, 7/25/02 1554) field samples.
MSM5972 – 7/15/02 0916, 7/16/02 1644

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 - 7/15/02 1M0715MB All NDs
44926A-3 Soil-0-1-05 → MB - 7/15/02 200715MB Trichloroethene ND 61 ug/kg, Toluene U,Z 200 ug/kg
MB - 7/16/02 1M0716MB MIBK 0.62 ug/kg, 2-Hexanone 1.9 ug/kg.
→ U,Z at RL
MB - 7/22/02 100722MB All NDs.
MB - 7/25/02 200725MB 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
(MSO5973) 7/11/02 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: C. Cal (MSM5972) 7/15/02 0953 Methylene chloride -30.9%.
7/16/02 1708 Methylene chloride -40.0%.

MSO5973 7/15/02 1957 All %Ds < 20% Acetone RRF = 0.0395
7/22/02 0945 1,1-dichloroethane 31.4%, Acetone RRF = 0.04156
7/25/02 1617 2-Hexanone -20.7%, Acetone RRF = 0.04167.

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:

Soil-0-1-0.5 Dibromofluoromethane 168% ↑ (58-142%)
med-level. Toluene-d8 168% ↑ (64-136%)
p-Bromofluorobenzene 164% ↑ (63-135%).

data not used. ~~J(1) only~~

This sample was re-analyzed (outside the hold time) and displayed acceptable surrogate recoveries.
↳ 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:

See LCS or 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?	[ ]	✓	

(*) 1,1-DCA was not detected in the associated samples (Med-level), ok.

	> 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 - 1M0715MB. (Low level) All %Rs were in control
LCS - 20Ø715MB (Med level) 1,1-dichloroethane 150% ↑ (51-129%)
LCS - 1MØ716MB - LCS/LCSD (Low) All %Rs and RPDs were in control.
LCS - 10Ø722MB - (Med level). 1,1-dichloroethane 132% (51-129%)
LCS - 20Ø725MB (Med level) 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: Soil-S-2-0.5 several Mass spectrum contain matrix interference
↳ low level

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: 11

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 = 99.4%

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:
SDG No.: SAII16

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 / JA

2.0 Holding Time

		Yes	No	NA
2.1	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		[✓]	
2.2	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		[✓]	

Matrix	Extraction	Analysis
Aqueous	7 days	40 days
Soil/Sediment	14 days	40 days

Note:

Date Collected	Date Extracted	H.T.	Date Analyzed	H.T.
7/10/02	7/16/02	6 days	7/23, 8/2, 8/9	7, 17, 24 days
7/11/02	7/17, 23/02	6, 12 days	8/4/02	18, 12 days
7/12/02	7/17/02	5 ~~15~~ days	8/4, 6/02	18, 20 days

JA

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: Instrument MSG5973.
7/20/02 1909. I.Cal., 7/22/02 1821. I.Cal, 7/31/02 0731 I.Cal
7/23/02 0758, ~~7/31/02 0731~~ (JB) 8/1/02 2205, 8/2/02 1645, I.Cal.
8/4/02 1144, 8/6/02 0826, 8/9/02 1205, 8/10/02 1050, I.Cal. 8/12/02 0732

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-0716A-EMB All NDs (Analyzed on 8/9/02)
MB-0716A-EMB (analyzed on 8/2/02) All NDs
MB-0717B-EMB All NDs. (8/6/02, 8/4/02).

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?	(7A) [✓]	✓	
	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 7/20/02. All %RSDs or r^2 were in control.
7/22/02 All %RSD was in control.
44926A-1, -3, -4DL, -5 → 7/31/02. 2,4-dinitrophenol $r^2 = 0.987$
UJ,R except 4DL
8/2/02 All %RSDs or r^2 were in control.
→ 8/10/02. 2,6-dinitrotoluene $r^2 = 0.987$; 3-nitroaniline $r^2 = 0.988$
0716A-GMBLCS, QC sample ok. 4-nitroaniline $r^2 = 0.986$

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 0825, 0902. All %Ds were in control.
8/1/02 2219, 2314 4-chloroaniline -34.8%.
8/4/02 1205, 1243 bis(2-chloroisopropyl)ether -20.9%.
8/6/02 0850, 0923 All %Ds were in control.
8/9/02 1221 1256 Hexachlorocyclopentadiene -27.8%, 2,4-dinitrophenol 23.2%
4-nitrophenol -21.2%, 4,6-dinitro-2-methylphenol 26.6%
8/12/02 0748 All %Ds were in control

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 in samples Soil-S-1-0.5 (DF=40) and Soil-S-1-0.5 DL (DF=400). JR

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 - 0-2-0.5 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 - 0717B-GMB - LCS/LCSD All %Rs and RPDs were in control.
LCS - 0716A-GMB - 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: check - Soil -S-2-0.5 / VL

12.0 TCL/TIC Quantitation and Reported Detection limits

		Yes	No	NA
12.1	Are reporting limits (RLs) used consistent with those specified in the QAPP?	[✓]		
12.2	Are these limits adjusted to reflect dilutions and/or percent solid as required?	[✓]		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	[ ]		✓
12.4	Are any positive reported that exceed the linear range of the instrument? If yes, than flag "J".	[✓]		
12.5	Were any transcription/calculation errors noted in the TCL or TIC data? Level IV only - 5% verification.		[ ]	✓

Note: PCP result in sample Soil-S-1-0.5 exceeded the linear range J,g
diluted and reanalyzed VL.

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: 13

14.1.2 Number of target compounds in each analysis: 65

14.1.3 Number of results rejected and/or not reported: 0

% Completeness = (14.1.1 x 14.1.2 - 14.1.3) x 100/(14.1.1 x 14.1.2)

% Completeness = 100%

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
PESTICIDE ANALYSIS - NFGs Modified for RCRA

Reviewer: JA
Date:
Lab: STL-Savannah

Project Name: Sauget Area II
Project Number:
SDG No.: SAII.16

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

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.
7/10/02	7/17/02	7 days	7/22, 8/2	5, 16 days
7/11/02	7/17/02	6 days	7/22, 8/2	5, 16 days
7/12/02.	7/17/02	5 days.	7/23, 8/2	6, 16 days

3.0 Blanks (Method Blanks and Field Blanks)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each matrix, each GC system used to analyze 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 - 07170-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. 7/18-19/02. (SGJ ECD) All %RSDs or r^2 were in control.

I. Cal 7/25/02 (SGR ECD All %RSDs or r^2 were in control.

I. Cal 8/7-8/02 (SGR ECD 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: 7/18/02 1426, 7/22/02 1817, 7/25/02 1321, 8/2/02 1357, 8/7/02 1925, 8/22/02 1049 } All % Breakdowns 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: See attached

7.0 Surrogate Recovery

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	[✓]		
7.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	[ ]	✓	
7.3	If No in Section 7.2, are these sample(s) or method blank(s) reanalyzed?	[ ]	✓	
7.4	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.) samples, then no reanalysis is required.	[✓]		

	> UCL	10% to LCL	< 10%
Positive	J	J	J
Non-detect	None	UJ	R

		Yes	No	NA
7.5	Were any transcription/calculation errors noted in the surrogate data? Level IV only - 5% verification.		[ ]	✓

Note:

	Soil-0-2-0.5	DCBP	263% ↑	(30-150%).
	Soil-0-1-0.5	DCBP	889% ↑.	
	Soil-R-3-6FT	DCBP	1526% ↑.	
9688-1	Soil-R-1-0.5	TCMX	26% / 29% ↓	J/UJ ✓
9688-4	Soil-R-2-6	TCMX	5% / 4%	J/R. ✓

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]	✓	
8.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

8.4 Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification. [ ]

Note: MS/MSD - Soil-0-3-0.5 (S244926A-5). Summary Form not provided. - check with lab.

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 - 07170 - RMB.

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 RPDs were >40% in each samples "J, g" See attached summary table.

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:

13.0 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: 13

13.1.2 Number of target compounds in each analysis: 21

13.1.3 Number of results rejected and/or not reported: 16

% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)

% Completeness = ~~100%~~ 94.1%

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 soil samples 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(-).		[✓]	
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.
7/10,11,12/02	7/19/02	7-9 days	7/31, 8/1, 8/7, 8/8	12 - 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
8/1/02 0646
8/7/02 0513
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 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 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:
7/31/02 0557, 1522
8/1/02 0750, 1440
8/7/02 0652, 1515
8/8/02 0926 1610.

All %Ds < 30% (for Soil 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:

Soil-0-1-0.5 0% DF=500
Soil-5-1-0.5 0% DF=500
Soil-5-1-0.5 DL 0% DF=1000

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-0-2-0.5 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-0719A-KMBLCS 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: (JA) ~~Perylene~~ Chrysene-d12

Soil-R-2-6 111214 ↑ 53572-99490 (76531) ±30%.

Soil-R-3-0.5FT 106579 ↑.

↳ All NDs 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 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-S-1-a.s- Trichlorobiphenyl 3 → J,q

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: 13

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: Savannah-STL

Project Name: Sauget Area II
Project Number:
SDG No.: SAII16

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 1.2°C - 5.7°C
only soil 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(-).		[✓]	

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.
7/10, 11/12	7/22/02	10-12 days.	7/26, 8/2, 8/9	4 - 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 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
Pentachlorophenol 1.8 ug/kg $\xrightarrow{\times 5}$ 8 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: I. Cal 7/22-23/02 & 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.		[ ]	✓

8/10/02 1046 DB-XLB 2,4-DB 20.6%.

Note: C. Cal. 7/26/02 0135 All %Ds <15%
7/26/02 1251 DB-XLB 2,4-D 18.6%, PCP 17.5%, 245-TP 17.7%, 245-T 16.9%
8/1/02 2238 DB-35MS 2,4-DB -19.8%
8/2/02 1242 DB-XLB MCPP 19.4%, 2,4D 16.7%, PCP 15.5%
8/9/02 2240 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: Soil-S-1-0.5' (DF=20), Soil-S-1-0.5-DL (DF=4000), Soil-O-3-0.5-DL (DF=20)

Soil-R-2-6 (DF=10), Soil-R-3-6FT (DF=10)

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	[ ]		✓
7.2	Are MS/MSDs analyzed at the required frequency for each matrix?	[ ]		✓
7.4	Are all MS/MSD %Rs and RPDs within acceptance criteria?	[ ]		✓

No action is taken on MS/MSD data alone. However, using informed professional judgment the data reviewer may use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data.

7.5 Were any transcription/calculation errors noted in the MS/MSD data? Level IV only - 5% verification. [ ] ✓

Note: See "case narrative"

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%)

↳ results either flagged U,Z due to method blank contamination or J,C due to C. Cal failure. no action was

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 RPDs >40% in each samples Tig.

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.: SAII16
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

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	7/10,11,12/02	8/6/02	25-27 days
Hg	7/10/11,12/02	8/2/02	21-23 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%).	✓						✓					
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% ↑
Se initial 127% ↑, final 145% ↑ → J(+), Since Positive ~~select~~ selenium results were flagged due to method blank contamination, no additional data flags were applied.
Na initial 74% ↓, final 66% ↓
Tl initial 73% ↓
As initial 125% ↑
Tl initial 85% ↓ → J/UJ

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: No Lab dup. - see MS/MSD

9.0 Spike Sample Analysis -Pre-Digestion

		ICP			GFAA			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	✓						✓					
9.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet. Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.		✓						✓				
9.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75 - 125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)		✓					✓					
	%R > 125% (120%) / 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-R-3-6FT Sb MS=61%, Pb MS= 205%, K MS=140%, MSD=246%. Na MS= 136%, Ba MSD= 129%, Cd ~~=73%~~ MSD=73%. V MSD= 153%.
Al RPD=23.9%, Pb RPD= 32.0%, Mg RPD=34.9%, K RPD=29.2% V RPD=28.4%. Zn = 46.7%.

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:
Soil-S-2-0.5 Co %D=13.6%) J(+)
Soil-O-2-0.5 Co %D=12.8%.
Soil-R-3-0.5 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:

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: 13												
12.1.2	Number of target compounds in each analysis: 23												
12.1.3	Number of results rejected and/or not reported: 0												
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)												
	% Completeness = 100%.												

Note:

DATA VALIDATION WORKSHEET - Level III/IV Review
VOLATILE ORGANIC ANALYSIS - NFGs modified for RCRA

Reviewer: RA
Date: 9/16/02
Lab: STL

Project Name: Sauget Area II
Project Number: 215608868.6005
SDG No.: SA#17

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(-).		[✓]	

Matrix	Preserved	Aromatic	All others
Aqueous	No	7 days	14 days
	Yes	14 days	14 days
Soil/Sediment	4 ^{o}C ± 2 ^{o}C	14 days	14 days

2.2	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-).		[✓]	

Note: collect. analyzed TCLP extract.
7/11/12/02 7/30, 31/02 7/17/02, 7/18/02

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:

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 7/31/02
2-butanone %D 52.8%. Pos. J/C, ND UJ/C in all 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.)	[ ]		✓

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 174% 42-167
RPD 40% 31% no action 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:

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