APPENDIX C: DATA VALIDATION REPORTS

ATTACHMENT C-1: TISSUE CHEMISTRY
ATTACHMENT C-2: SEDIMENT CHEMISTRY
ATTACHMENT C-3: DDT CONFIRMATION ANALYSES – TISSUE
ATTACHMENT C-4: DDT CONFIRMATION ANALYSES – SEDIMENT

Attachment C-1: Tissue Chemistry

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Windward Environmental, LLC
200 West Mercer Street, Suite 401
Seattle, WA 98119
ATTN: Ms. Susie McGroddy

January 6, 2005

SUBJECT: Lower Duwamish Waterway Group Tissue Sample Data Validation

Dear Ms. McGroddy,

Enclosed is our revised EPA Level II and Level IV data validation review of Analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. All analyses were performed by Columbia Analytical Services, Inc., with the exception of Inorganic Arsenic which was performed by BrooksRand Trace Metals Analysis & Products. Samples were analyzed for GC/MS Semivolatiles by EPA SW 846 Method 8270C-SIM, GC/MS Polynuclear Aromatic Hydrocarbons by EPA SW 846 Method 8270C-SIM, GC Butyltins by the Krone Method, GC Chlorinated Pesticides by EPA SW 846 Method 8081A, GC Polychlorinated Biphenyls by EPA SW 846 Method 8082, Metals by EPA SW 846 Methods 6010B/6020/7471A, Inorganic Arsenic by modified EPA Method 1632 and Total Lipids by NOAA Method. Samples are referenced under the following Sample Delivery Groups: K2406232, K2406297, K2406517, K2406581, K2406932, K2407216, K2407455, K2407452, K2407596, 04BR710, and 04BR739.

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco

Stella S. Cuenco
Project Manager/Senior Chemist

Attachment 1

Job #04-08-06-21 **LDC #12662 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)**

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C-SIM)		PAHs (8270C-SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl -tins (Krone)		Total Lipids (NOAA)																			
Matrix:	Water/Tissue			W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406232	10/22/04	11/12/04	0	14	0	14	0	7	0	7	0	7	0	7	0	7																		
B	K2406297	10/22/04	11/12/04	0	6	0	6	0	3	0	3	0	3	0	3	0	3																		
C	K2406517	10/22/04	11/12/04	0	14	0	14	0	14	0	14	0	14	0	28	0	14																		
D	K2406581	10/22/04	11/12/04	0	2	0	2	0	1	0	1	0	1	0	1	0	1																		
E	K2406932	10/22/04	11/12/04	0	4	0	4	0	2	0	2	0	2	0	2	0	2																		
F	K2407216	10/22/04	11/12/04	0	5	0	4	0	2	0	2	0	2	0	2	0	2																		
Total	B			0	45	0	44	0	29	0	29	0	29	0	43	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	248

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12662ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12691 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	As (1632)																															
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
G	04BR710	10/29/04	11/18/04	6	0																														
G	04BR710	10/29/04	11/18/04	2	0																														
Total	B			8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12691STG.wpd

Attachment 1

Job #04-08-06-21 LDC #12734 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C-SIM)		PAHs (8270C-SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl-tins (Krone)		TOC (PSEP)																			
Matrix: Tissue/Sediment				T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2407452	11/05/04	11/26/04	1	0	1	0	1	0	1	0	1	0	1	0	1	0																		
D	K2407596	11/05/04	11/26/04	4	0	4	0	4	0	4	0	4	0	4	0	4	0																		
Total	B			5	0	5	0	5	0	5	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12734STT.wpd

Attachment 1

Job #04-08-06-21 LDC #12736 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	Arsenic (6010B)		Total Lipids (NOAA)																													
Matrix	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2407455	11/08/04	11/29/04	10	0	12	0																												
A	K2407455	11/08/04	11/29/04	2	0	-	-																												
Total	B			12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12736ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12747 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	Arsenic (6010B)																															
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	04BR739	11/10/04	12/01/04	12	0																														
Total	B			12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12747ST.wpd

CHEMICAL DATA QUALITY REVIEW FOR TISSUE SAMPLES

Lower Duwamish Waterway Group
LDC# 12662, 12691, 12734, 12736, & 12747

This report details the findings of an EPA Level II and Level IV data validation review of Analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. All analyses were performed by Columbia Analytical Services, Inc., with the exception of Inorganic Arsenic which was performed by BrooksRand Trace Metals Analysis & Products. Samples were analyzed for GC/MS Semivolatiles by EPA SW 846 Method 8270C-SIM, GC/MS Polynuclear Aromatic Hydrocarbons by EPA SW 846 Method 8270C-SIM, GC Butyltins by the Krone Method, GC Chlorinated Pesticides by EPA SW 846 Method 8081A, GC Polychlorinated Biphenyls by EPA SW 846 Method 8082, Metals by EPA SW 846 Methods 6010B/6020/7471A, Inorganic Arsenic by modified EPA Method 1632 and Total Lipids by NOAA Method. Samples are referenced under the following Sample Delivery Groups: K2406232, K2406297, K2406517, K2406581, K2406932, K2407216, K2407455, K2407452, K2407596, 04BR710, and 04BR739. See the Sample Analysis Table (Attachment 1) for the number of samples reviewed and the Sample Validation Table (Attachment 2) for the sample identifications and analyses. Sample IDs ending in "**" underwent Level IV review.

The QC guidelines used for data qualification are those specified in the National Functional Guidelines for Organic Data Review (October 1999) and the National Functional Guidelines for Inorganic Data Review (July 2002). Specific QC criteria used follows the Final Benthic Invertebrate Sampling of the Lower Duwamish Waterway Quality Assurance Project Plan (July 30, 2004). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The following items were evaluated during the review:

- Holding Times
- Sample Preservation
- Cooler Temperatures
- Instrument Calibration*
- Blanks
- Surrogates
- Matrix Spike/Matrix Spike Duplicates
- Internal Standards*
- Laboratory Control Samples
- Target Compound Identifications*
- Compound Quantitation and CRQLs*
- System Performance
- Field Duplicates

*Data were not reviewed for Level II.

Only issues which require comment or action are discussed in this report. Data deficiencies are arranged by method. Potential effects of data anomalies have been described where possible.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

Attachment 1

Job #04-08-06-21 **LDC #12662 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)**

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C-SIM)		PAHs (8270C-SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl -tins (Krone)		Total Lipids (NOAA)																	
Matrix:	Water/Tissue			W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406232	10/22/04	11/12/04	0	14	0	14	0	7	0	7	0	7	0	7	0	7																
B	K2406297	10/22/04	11/12/04	0	6	0	6	0	3	0	3	0	3	0	3	0	3																
C	K2406517	10/22/04	11/12/04	0	14	0	14	0	14	0	14	0	14	0	28	0	14																
D	K2406581	10/22/04	11/12/04	0	2	0	2	0	1	0	1	0	1	0	1	0	1																
E	K2406932	10/22/04	11/12/04	0	4	0	4	0	2	0	2	0	2	0	2	0	2																
F	K2407216	10/22/04	11/12/04	0	5	0	4	0	2	0	2	0	2	0	2	0	2																
Total	B			0	45	0	44	0	29	0	29	0	29	0	43	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	248

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12662ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12691 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	Arsenic (1632)																													
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
G	04BR710	10/29/04	11/18/04	6	0																												
G	04BR710	10/29/04	11/18/04	2	0																												
Total	B			8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12791GST.wpd

Job #04-08-06-21 LDC #12734 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C-SIM)		PAHs (8270C-SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl -tins (Krone)		Total Lipids (NOAA)																							
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S																				
A	K2407452	11/05/04	11/26/04	1	0	1	0	1	0	1	0	1	0	1	0	1	0																				
D	K2407596	11/05/04	11/26/04	4	0	4	0	4	0	4	0	4	0	4	0	4	0																				
Total	B			5	0	5	0	5	0	5	0	5	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12734ST_tissue.wpd

Attachment 1

Job #04-08-06-21 LDC #12736 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	Arsenic (6010B)		Total Lipids (NOAA)																													
Matrix	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2407455	11/08/04	11/29/04	10	0	12	0																												
A	K2407455	11/08/04	11/29/04	2	0	-	-																												
Total	B			12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12736ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12747 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)																																			
LDC	SDG#	DATE REC'D	DATE DUE	Arsenic (1632)																															
Matrix: Tissue/Sediment				T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	04BR739	11/10/04	12/01/04	12	0																														
Total	B			12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12747ST.wpd

Attachment 2

SDG#: K2406232 VALIDATION SAMPLE TABLE **LDC#:** 12662A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl-tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LDW-B1a-T	K2406232-001	tissue	08/15/04	X	X	X	X	X	X			X			
LDW-B1a-TRE	K2406232-001RE	tissue	08/15/04	X	X										
LDW-B4a-T	K2406232-002	tissue	08/14/04	X	X	X	X	X	X			X			
LDW-B4a-TRE	K2406232-002RE	tissue	08/14/04	X	X										
LDW-B2a-T	K2406232-003	tissue	08/14/04	X	X	X	X	X	X			X			
LDW-B2a-TRE	K2406232-003RE	tissue	08/14/04	X	X										
LDW-B9b-T	K2406232-004	tissue	08/11/04	X	X	X	X	X	X			X			
LDW-B9b-TRE	K2406232-004RE	tissue	08/11/04	X	X										
LDW-B6a-T	K2406232-005	tissue	08/15/04	X	X	X	X	X	X			X			
LDW-B6a-TRE	K2406232-005RE	tissue	08/15/04	X	X										
LDW-B3b-T	K2406232-008	tissue	08/10/04	X	X	X	X	X	X			X			
LDW-B3b-TRE	K2406232-008RE	tissue	08/10/04	X	X										
LDW-B7b-T	K2406232-009	tissue	08/13/04	X	X	X	X	X	X			X			
LDW-B7b-TRE	K2406232-009RE	tissue	08/13/04	X	X										

Note: X = Validation was performed.

12662VALA.wpd

Attachment 2

SDG#: K2406297 VALIDATION SAMPLE TABLE **LDC#:** 12662B

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl-tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LWD-B6b-T	K2406297-001	tissue	08/18/04	X	X	X	X	X	X			X			
LWD-B6b-TRE	K2406297-001RE	tissue	08/18/04	X	X										
LWD-B8b-T	K2406297-002	tissue	08/19/04	X	X	X	X	X	X			X			
LWD-B8b-TRE	K2406297-002RE	tissue	08/19/04	X	X										
LDW-B10b-T	K2406297-003	tissue	08/19/04	X	X	X	X	X	X			X			
LDW-B10b-TRE	K2406297-003RE	tissue	08/19/04	X	X										

Note: X = Validation was performed.

12662VALB.wpd

Attachment 2

SDG#: K2406517 VALIDATION SAMPLE TABLE **LDC#:** 12662C

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl-tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-C8-T	K2406517-001	tissue	08/26/04	X	X	X	X	X	X			X			
LDW-C8-TDL	K2406517-001DL	tissue	08/26/04						X						
LDW-C7-T2	K2406517-002	tissue	08/26/04	X	X	X	X	X	X			X			
LDW-C7-T2DL	K2406517-002DL	tissue	08/26/04						X						
LDW-C7-T1	K2406517-003	tissue	08/26/04	X	X	X	X	X	X			X			
LDW-C7-T1DL	K2406517-003DL	tissue	08/26/04						X						
LDW-C1-T	K2406517-004	tissue	08/26/04	X	X	X	X	X	X			X			
LDW-C1-TDL	K2406517-004DL	tissue	08/26/04						X						
LDW-C2-T1	K2406517-005	tissue	08/26/04	X	X	X	X	X	X			X			
LDW-C2-T1DL	K2406517-005DL	tissue	08/26/04						X						
LDW-C2-T2	K2406517-006	tissue	08/26/04	X	X	X	X	X	X			X			
LDW-C2-T2DL	K2406517-006DL	tissue	08/26/04						X						
LDW-C10-T2	K2406517-007	tissue	08/25/04	X	X	X	X	X	X			X			
LDW-C10-T2DL	K2406517-007DL	tissue	08/25/04						X						
LDW-C10-T1	K2406517-008	tissue	08/25/04	X	X	X	X	X	X			X			
LDW-C10-T1DL	K2406517-008DL	tissue	08/25/04						X						
LDW-C5-T	K2406517-009	tissue	08/27/04	X	X	X	X	X	X			X			
LDW-C5-TDL	K2406517-009DL	tissue	08/27/04						X						
LDW-C3-T2	K2406517-010	tissue	08/27/04	X	X	X	X	X	X			X			
LDW-C3-T2DL	K2406517-010DL	tissue	08/27/04						X						
LDW-C3-T1	K2406517-011	tissue	08/27/04	X	X	X	X	X	X			X			
LDW-C3-T1DL	K2406517-011DL	tissue	08/27/04						X						
LDW-C9-T	K2406517-012	tissue	08/25/04	X	X	X	X	X	X			X			
LDW-C9-TDL	K2406517-012DL	tissue	08/25/04						X						
LDW-C6-T	K2406517-013	tissue	08/25/04	X	X	X	X	X	X			X			

Note: X = Validation was performed.

12662VALC.wpd

SDG#: K2406517 VALIDATION SAMPLE TABLE **LDC#:** 12662C

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl-tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-C6-TDL	K2406517-013DL	tissue	08/25/04						X						
LDW-C4-T	K2406517-014	tissue	08/27/04	X	X	X	X	X	X			X			
LDW-C4-TDL	K2406517-014DL	tissue	08/27/04						X						
LDW-C2-T2MS	K2406517-006MS	tissue	08/26/04	X	X	X	X	X	X						
LDW-C2-T2MSD	K2406517-006MSD	tissue	08/26/04	X	X	X	X		X						
LDW-C2-T2DUP	K2406517-006DUP	tissue	08/26/04	X	X	X	X	X				X			
LDW-C2-T2TRP	K2406517-006TRP	tissue	08/26/04									X			

Note: X = Validation was performed.

12662VALC.wpd

Attachment 2

SDG#: K2406581 VALIDATION SAMPLE TABLE **LDC#:** 12662D

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LDW-B7a-T	K2406581-001	tissue	08/30/04	X	X	X	X	X	X			X			
LDW-B7a-TRE	K2406581-001RE	tissue	08/30/04	X	X										

Note: X = Validation was performed.

12662VALD.wpd

Attachment 2

SDG#: K2406932 VALIDATION SAMPLE TABLE **LDC#:** 12662E

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl-tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LDW-B8a-T	K2406932-006	tissue	08/17/04	X	X	X	X	X	X			X			
LDW-B8a-TRE	K2406932-006RE	tissue	08/17/04	X	X										
LDW-B10a-T	K2406932-009	tissue	08/25/04	X	X	X	X	X	X			X			
LDW-B10a-TRE	K2406932-009RE	tissue	08/25/04	X	X										

Note: X = Validation was performed.

12662VALE.wpd

Attachment 2

SDG#: K2407216 VALIDATION SAMPLE TABLE **LDC#:** 12662F

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl-tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LDW-B3a-T	K2407216-001	tissue	08/26/04	X	X	X	X	X	X			X			
LDW-B3a-TRE	K2407216-001RE	tissue	08/26/04	X	X										
LDW-B9a-T	K2407216-002	tissue	08/27/04	X	X	X	X	X	X			X			
LDW-B9a-TDL	K2407216-002DL	tissue	08/27/04	X											
LDW-B9a-TRE	K2407216-002RE	tissue	08/27/04	X	X										

Note: X = Validation was performed.

Attachment 2

SDG#: 04BR710 | VALIDATION SAMPLE TABLE | **LDC#:** 12691G

Project Name: Lower Duwamish Waterway Group | Parameters/Analytical Method | Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	As (1632)											
LDW-C7-T2	04BR710-1	tissue	08/26/04	X											
LDW-C1-T**	04BR710- 2**	tissue	08/26/04	X											
LDW-C2-T1**	04BR710- 3**	tissue	08/26/04	X											
LDW-C5-T	04BR710-4	tissue	08/27/04	X											
LDW-C3-T1	04BR710-5	tissue	08/27/04	X											
LDW-C9-T	04BR710-6	tissue	08/25/04	X											
LDW-C6-T	04BR710-7	tissue	08/25/04	X											
LDW-C4-T	04BR710-8	tissue	08/27/04	X											
LDW-C2-T1MS	04BR710-3MS	tissue	08/26/04	X											
LDW-C2-T1MSD	04BR710-3MSD	tissue	08/26/04	X											

Note: X = Validation was performed.

Attachment 2

SDG#: K2407452 VALIDATION SAMPLE TABLE **LDC#:** 12734A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846	Butyl-tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LDW-B5a-T	K2407452-001	tissue	09/24/04	X	X	X	X	X	X			X			

Note: X = Validation was performed.

12734VALA.wpd

Attachment 2

SDG#: K2407596 VALIDATION SAMPLE TABLE **LDC#:** 12734D

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C-SIM)	PAHs (8270C-SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LDW-B4b-T	K2407596-001	tissue	09/28/04	X	X	X	X	X	X			X			
LDW-B5b-T	K2407596-002	tissue	09/28/04	X	X	X	X	X	X			X			
LDW-B1b-T	K2407596-003	tissue	09/27/04	X	X	X	X	X	X			X			
LDW-B2b-T	K2407596-004	tissue	09/27/04	X	X	X	X	X	X			X			
LDW-B5b-TDUP	K2407596-002DUP	tissue	09/28/04			X	X					X			

Note: X = Validation was performed.

12734VALD.wpd

Attachment 2

SDG#: K2407455 | VALIDATION SAMPLE TABLE | **LDC#:** 12736A

Project Name: Lower Duwamish Waterway Group | Parameters/Analytical Method | Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	As (6010B)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
BI-C-T1	K2407455-001	tissue	09/23/04					X				X			
BI-C-T2	K2407455-002	tissue	09/23/04					X				X			
BI-C-T3	K2407455-003	tissue	09/23/04					X				X			
BI-C-T4	K2407455-004	tissue	09/23/04					X				X			
BI-C-T5	K2407455-005	tissue	09/23/04					X				X			
BI-C-T6	K2407455-006	tissue	09/23/04					X				X			
SP-C-T1	K2407455-007	tissue	09/23/04					X				X			
SP-C-T2	K2407455-008	tissue	09/23/04					X				X			
SP-C-T3	K2407455-009	tissue	09/23/04					X				X			
SP-C-T4	K2407455-010	tissue	09/23/04					X				X			
SP-C-T5	K2407455-011	tissue	09/23/04					X				X			
SP-C-T6	K2407455-012	tissue	09/23/04					X				X			
BI-C-T3MS	K2407455-003MS	tissue	09/23/04					X							
BI-C-T3DUP	K2407455-003DUP	tissue	09/23/04					X							
BI-C-T1DUP	K2407455-001DUP	tissue	09/23/04									X			
BI-C-T1TRP	K2407455-001TRP	tissue	09/23/04									X			

Note: X = Validation was performed.

Attachment 2

SDG#: 04BR739 VALIDATION SAMPLE TABLE **LDC#:** 12747A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	As (1632)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
B1-C-T1	04BR739-1	tissue	09/23/04					X							
B1-C-T2	04BR739-2	tissue	09/23/04					X							
B1-C-T3	04BR739-3	tissue	09/23/04					X							
B1-C-T4	04BR739-4	tissue	09/23/04					X							
B1-C-T5	04BR739-5	tissue	09/23/04					X							
B1-C-T6	04BR739-6	tissue	09/23/04					X							
SP-C-T1	04BR739-7	tissue	09/23/04					X							
SP-C-T2	04BR739-8	tissue	09/23/04					X							
SP-C-T3	04BR739-9	tissue	09/23/04					X							
SP-C-T4	04BR739-10	tissue	09/23/04					X							
SP-C-T5	04BR739-11	tissue	09/23/04					X							
SP-C-T6	04BR739-12	tissue	09/23/04					X							
B1-C-T4MS	04BR739-4MS	tissue	09/23/04					X							
B1-C-T4MSD	04BR739-4MSD	tissue	09/23/04					X							
SP-C-T4MS	04BR739-10MS	tissue	09/23/04					X							
SP-C-T4MSD	04BR739-10MSD	tissue	09/23/04					X							

Note: X = Validation was performed.

12747VALA.wpd

Overall Data Assessment

QC exceedances, compound identification, compound quantitation, instrument calibration, and method blank contamination problems have warranted the qualification of a portion of the data set.

Zero percent recovery of Benzidine in the LCS have warranted the qualification of non-detected results for Benzidine as rejected (R) in the semivolatile analyses for SDGs K2407452 and K2407596. This compound is known to have poor recoveries when analyzed by method 8270C.

Compound identification problems have warranted the qualification of detected results as presumptive and estimated (NJ) in the pesticide analysis for SDG K2406232.

Compound quantitation problems have warranted the qualification of detected results as estimated (J) in the semivolatile analysis for SDG K2407216, in the pesticide analyses for SDGs K2406232, K2406517, K2406581, K2406932, K2407216, K2407452, K2407596 and in the PCB and butyltin analyses for SDG K2406517.

Instrument calibration problems have warranted the qualification of detected results for hexachlorocyclopentadiene, 4-nitrophenol and 2-methyl-4,6-dinitrophenol as estimated (J) and non-detected results as estimated (UJ) in the semivolatile analysis for SDG K2406232.

Method blank contamination have warranted the qualification of phenol as non-detected (U) in the semivolatile analysis for SDG K2406297 and naphthalene as non-detected (U) in the polynuclear aromatic hydrocarbon analysis for K2406517.

QC exceedances have warranted the qualification of detected results for semivolatile, pesticide, metal and inorganic arsenic data as estimated (J) and non-detected results as estimated (UJ) in SDGs K2406232, K2406517, SDG K2406297, K2406581, K2406932, K2407216, K2407452, K2407596 .

The required frequency of MS/MSD and Duplicates were not met for all analyses due to insufficient sample amount.

The required frequency of SRM analysis was not met for the semivolatile analyses. However, SRM analysis was performed for the polynuclear aromatic hydrocarbons analyses.

The required frequency of SRM analysis was not met for the metal and inorganic arsenic analyses.

*Field duplicates were not collected for this sampling event.

Based upon the information reviewed, the overall data quality is considered acceptable with the noted limitations.

GC/MS Semivolatiles by EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM)

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406232	LDW-B1a-T** LDW-B1a-TRE** LDW-B4a-T** LDW-B4a-TRE** LDW-B2a-T** LDW-B2a-TRE** LDW-B9b-T** LDW-B9b-TRE** LDW-B6a-T** LDW-B6a-TRE**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory, however the laboratory indicated that the samples were then immediately stored frozen.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements.

Instrument performance check data were not reviewed for Level II.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

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

Initial calibration data were not reviewed for Level II.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Associated SDG	Date	Compound	%D	Associated Samples	Flag	A or P
K2406232	10/4/04	Hexachlorocyclopentadiene 4-Nitrophenol 2-Methyl-4,6-dinitrophenol	45 28 32	LDW-B1a-TRE** LDW-B4a-TRE** LDW-B2a-TRE** LDW-B9b-TRE** LDW-B6a-TRE** LDW-B3b-TRE** LDW-B7b-TRE** KWG0414745-3	J (all detects) UJ (all non-detects)	A

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

Continuing calibration data were not reviewed for Level II.

V. Blanks

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

Associated SDG	Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
K2406232 K2406297 K2406581 K2406932 K2407216	KWG0414745-3	9/28/04	Phenol	22 ug/Kg	LDW-B1a-T** LDW-B1a-TRE** LDW-B4a-T** LDW-B4a-TRE** LDW-B2a-T** LDW-B2a-TRE** LDW-B9b-T** LDW-B9b-TRE** LDW-B6a-T** LDW-B6a-TRE** LDW-B3b-T** LDW-B3b-TRE** LDW-B7b-T** LDW-B7b-TRE** LDW-B6b-T LDW-B6b-TRE LDW-B8b-T LDW-B8b-TRE LDW-B10b-T LDW-B10b-TRE LDW-B7a-T LDW-B7a-TRE LDW-B8a-T LDW-B8a-TRE LDW-B10a-T LDW-B10a-TRE LDW-B3a-T LDW-B3a-TRE LDW-B9a-T LDW-B9a-TDL LDW-B9a-TRE
K2407452 K2407596	KWG0416318-5	10/21/04	Bis(2-ethylhexyl)phthalate	200 ug/Kg	LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Associated SDG	Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
K2406297	LDW-B8b-T	Phenol	89 ug/Kg	500U ug/Kg
K2406297	LDW-B8b-TRE	Phenol	99 ug/Kg	500U ug/Kg

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits for SDG K2406517 with the following exceptions:

Associated SDG	Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
K2406517	LDW-C2-T2MS/MSD (LDW-C2-T2)	4-Chloro-3-methylphenol	-	132 (20-130)	-	J (all detects)	A

The laboratory has indicated that there was insufficient sample for analysis of the matrix spike and matrix spike duplicate for SDGs K2406232, K2406297, K2406581, K2406932, K2407216, K2407452, and K2407596.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits for SDG K2406517.

VIII. Laboratory Control Samples (LCS)

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

Associated SDG	LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
K2406232 K2406297 K2406581 K2406932 K2407216	KWG0414745-1/2 LDW-B1a-T** LDW-B1a-TRE** LDW-B4a-T** LDW-B4a-TRE** LDW-B2a-T** LDW-B2a-TRE** LDW-B9b-T** LDW-B9b-TRE** LDW-B6a-T** LDW-B6a-TRE** LDW-B3b-T** LDW-B3b-TRE** LDW-B7b-T** LDW-B7b-TRE** LDW-B6b-T LDW-B6b-TRE LDW-B8b-T LDW-B8b-TRE LDW-B10b-T LDW-B10b-TRE LDW-B7a-T LDW-B7a-TRE LDW-B8a-T LDW-B8a-TRE LDW-B10a-T LDW-B10a-TRE LDW-B3a-T LDW-B3a-TRE LDW-B9a-T LDW-B9a-TDL LDW-B9a-TRE	Aniline 2,4-Dimethylphenol Benzidine	19 (20-130) 5 (20-130) 2 (20-130)	- 6 (20-130) 1 (20-130)	- - 64 (≤50)	J (all detects) UJ (all non-detects)	P
K2406517	KWG0413784-3/4 (LDW-C8-T LDW-C7-T2 LDW-C7-T1 LDW-C1-T LDW-C2-T1 LDW-C2-T2 LDW-C10-T2 LDW-C10-T1 LDW-C5-T LDW-C3-T2 LDW-C3-T1 LDW-C9-T LDW-C6-T LDW-C4-T)	2,4-Dimethylphenol Benzoic acid	16 (20-130) 7 (20-130)	- -	59 (≤50) 118 (≤50)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
K2407452 K2407596	KWG0416318-3/4 (LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T)	2,4-Dimethylphenol	11 (20-130)	-	102 (≤50)	J (all detects) UJ (all non-detects)	P
K2407452 K2407596	KWG0416318-3/4 (LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T)	2,6-Dinitrotoluene Carbazole Butylbenzylphthalate Bis(2-ethylhexyl)phthalate	136 (20-130) 137 (20-130) 214 (20-130) 144 (20-130)	149 (20-130) - 212 (20-130) 145 (20-130)	- - - -	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

Associated SDG	LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
K2407452 K2407596	KWG0416318-3/4 (LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T)	Benzidine	0 (20-130)	13 (20-130)	200 (≤50)	J (all detects) R (all non-detects)	P

No standard reference material analysis data were associated with these samples.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

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

Internal standards data were not reviewed for Level II.

XI. Target Compound Identifications

All target compound identifications were within validation criteria.

Target compound identifications data were not reviewed for Level II.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding	Criteria	Flag	A or P
K2407216	LDW-B9a-T LDW-B9a-TRE	4-Methylphenol	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Compound quantitation and CRQLs data were not reviewed for Level II.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory for Level IV.

Tentatively identified compounds data were not reviewed for Level II.

XIV. System Performance

The system performance was acceptable.

System performance data were not reviewed for Level II.

XV. Overall Assessment

The overall assessment of data was acceptable. In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Associated SDG	Sample	Compound	Flag	A or P
K2406232	LDW-B1a-T**	Phenol	R	A
K2406232	LDW-B1a-TRE**	All TCL compounds except Phenol	R	A
K2406232 K2406581	LDW-B4a-T** LDW-B7a-T	Benzoic acid 4-Chloro-3-methylphenol	R R	A
K2406232 K2406581	LDW-B4a-TRE** LDW-B7a-TRE	All TCL compounds except Benzoic acid 4-Chloro-3-methylphenol	R	A
K2406232 K2406297 K2406932	LDW-B2a-T** LDW-B9b-T** LDW-B6a-T** LDW-B10b-T LDW-B8a-T LDW-B10a-T	Benzoic acid	R	A
K2406232 K2406297 K2406932	LDW-B2a-TRE** LDW-B9b-TRE** LDW-B6a-TRE** LDW-B10b-TRE LDW-B8a-TRE LDW-B10a-TRE	All TCL compounds except Benzoic acid	R	A
K2406232	LDW-B3b-T**	Phenol Benzyl alcohol Benzoic acid	R R R	A
K2406232 K2407216	LDW-B3b-TRE** LDW-B9a-TRE	All TCL compounds except Phenol Benzyl alcohol Benzoic acid	R	A
K2406232 K2407216	LDW-B7b-T** LDW-B3a-T	4-Methylphenol Benzoic acid	R R	A
K2406232 K2407216	LDW-B7b-TRE** LDW-B3a-TRE	All TCL compounds except 4-Methylphenol Benzoic acid	R	A

*Indicates change as the result of report review.

Associated SDG	Sample	Compound	Flag	A or P
K2406297	LDW-B6b-TRE	All TCL compounds	R	A
K2406297	LDW-B8b-T	Phenol Benzoic acid	R R	A
K2406297	LDW-B8b-TRE	All TCL compounds except Phenol Benzoic acid	R	A
K2407216	LDW-B9a-T	Phenol Benzyl alcohol 4-Methylphenol Benzoic acid	R R R R	A
K2407216	LDW-B9a-TDL	All TCL compounds except 4-Methylphenol	R	A

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

*XVI. Field Duplicates

No field duplicates were identified in these SDGs.

XVII. Field Blanks

No field blanks were identified in these SDGs.

Polynuclear Aromatic Hydrocarbons and Alkylated Polynuclear Aromatic Hydrocarbons by EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM).

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding	Criteria
K2406232	LDW-B1a-T** LDW-B1a-TRE** LDW-B4a-T** LDW-B4a-TRE** LDW-B2a-T** LDW-B2a-TRE** LDW-B9b-T** LDW-B9b-TRE** LDW-B6a-T** LDW-B6a-TRE**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory.	Cooler temperature must be 4±2°C .

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements.

Instrument performance check data were not reviewed for Level II.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

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

Initial calibration data were not reviewed for Level II.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

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

Continuing calibration data were not reviewed for Level II.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Associated SDG	Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
K2406232 K2406297 K2406581 K2406932 K2407216	KWG0414844-3	9/29/04	Naphthalene Biphenyl Fluoranthene Pyrene	0.58 ug/Kg 0.14 ug/Kg 0.072 ug/Kg 0.11 ug/Kg	LDW-B1a-T** LDW-B1a-TRE** LDW-B4a-T** LDW-B4a-TRE** LDW-B2a-T** LDW-B2a-TRE** LDW-B9b-T** LDW-B9b-TRE** LDW-B6a-T** LDW-B6a-TRE** LDW-B3b-T** LDW-B3b-TRE** LDW-B7b-T** LDW-B7b-TRE** LDW-B6b-T LDW-B6b-TRE LDW-B8b-T LDW-B8b-TRE LDW-B10b-T LDW-B10b-TRE LDW-B7a-T LDW-B8a-TRE LDW-B10a-TRE LDW-B3a-TRE LDW-B9a-TRE
K2406517	KWG0413793-5	9/13/04	Naphthalene Fluoranthene	0.33 ug/Kg 0.073 ug/Kg	LDW-C8-T LDW-C7-T2 LDW-C7-T1 LDW-C1-T LDW-C2-T1 LDW-C2-T2 LDW-C10-T2 LDW-C10-T1 LDW-C5-T LDW-C3-T2 LDW-C3-T1 LDW-C9-T LDW-C6-T LDW-C4-T
K2407452 K2407595	KWG0416322-5	10/21/04	Naphthalene Biphenyl	0.42 ug/Kg 0.20 ug/Kg	LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Associated SDG	Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
K2406517	LDW-C8-T	Naphthalene	1.6 ug/Kg	1.6U ug/Kg
K2406517	LDW-C7-T2	Naphthalene	0.80 ug/Kg	0.99U ug/Kg
K2406517	LDW-C7-T1	Naphthalene	0.90 ug/Kg	0.99U ug/Kg
K2406517	LDW-C1-T	Naphthalene	0.79 ug/Kg	1.0U ug/Kg
K2406517	LDW-C2-T1	Naphthalene	0.71 ug/Kg	1.0U ug/Kg
K2406517	LDW-C2-T2	Naphthalene	0.83 ug/Kg	1.0U ug/Kg
K2406517	LDW-C10-T2	Naphthalene	0.59 ug/Kg	1.0U ug/Kg
K2406517	LDW-C10-T1	Naphthalene	0.57 ug/Kg	0.99U ug/Kg
K2406517	LDW-C5-T	Naphthalene	0.96 ug/Kg	1.0U ug/Kg
K2406517	LDW-C3-T2	Naphthalene	0.91 ug/Kg	1.0U ug/Kg
K2406517	LDW-C3-T1	Naphthalene	0.83 ug/Kg	1.0U ug/Kg
K2406517	LDW-C9-T	Naphthalene	0.78 ug/Kg	1.0U ug/Kg
K2406517	LDW-C6-T	Naphthalene	0.80 ug/Kg	1.0U ug/Kg
K2406517	LDW-C4-T	Naphthalene	1.0 ug/Kg	1.0U ug/Kg

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits for SDG K2406517.

The laboratory has indicated that there was insufficient sample for analysis of the matrix spike and matrix spike duplicate for SDGs K2406232, K2406297, K2406581, K2406932, K2407216, K2407452, and K2407596.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits for SDG K2406517.

VIII. Laboratory Control Samples (LCS)

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

No standard reference material analysis for Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Dibenzofuran, Acenaphthene, Fluorene, Anthracene, and Dibenz(a,h)anthracene were associated with these samples.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

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

Internal standards data were not reviewed for Level II.

XI. Target Compound Identifications

All target compound identifications were within validation criteria.

Target compound identifications data were not reviewed for Level II.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria.

Compound quantitation and CRQLs data were not reviewed for Level II.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory for Level IV.

Tentatively identified compounds data were not reviewed for Level II.

XIV. System Performance

The system performance was acceptable.

System performance data were not reviewed for Level II.

XV. Overall Assessment

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

***XVI. Field Duplicates**

No field duplicates were identified in these SDGs.

XVII. Field Blanks

No field blanks were identified in these SDGs.

GC Chlorinated Pesticides by EPA SW 846 Method 8081A

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406232	LDW-B1a-T** LDW-B4a-T** LDW-B2a-T** LDW-B9b-T** LDW-B6a-T**	All TCL compounds	The laboratory indicated the samples were frozen upon receipt.

II. GC/ECD Instrument Performance Check

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

Instrument performance check data were not reviewed for Level II.

III. Initial Calibration

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

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

Retention time windows were evaluated and considered technically acceptable.

Initial calibration data were not reviewed for Level II.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent difference (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

Retention times (RT) of all compounds in the calibration standards were within QC limits.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

Continuing calibration data were not reviewed for Level II.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks with the following exceptions:

Associated SDG	Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
K2407452 K2407596	KWG0416041-7	10/15/04	Methoxychlor	0.81 ug/Kg	LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

VI. Surrogate Spikes

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

Associated SDG	Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
K2406297	LDW-B10b-T	Tetrachloro-m-xylene	156 (30-150)	All TCL compounds	J (all detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Associated SDG	Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
K2406517	LDW-C2-T2MS/MSD (LDW-C2-T2)	Endrin aldehyde	32 (30-150)	29 (30-150)	-	J (all detects) UJ (all non-detects)	A

The laboratory has indicated that there was insufficient sample for analysis of the matrix spike and matrix spike duplicate for SDGs K2406232, K2406297, K2406581, K2406932, K2407216, K2407452, and K2407596.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits in SDG K2406517 and K2407596.

VIII. Laboratory Control Samples (LCS)

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

Standard reference material were within QC limits with the following exceptions:

Associated SDG	SRM ID	Compound	Concentration (Limits)	Associated Samples	Flag	A or P
K2406517	SRM 1945	delta-BHC	16 ug/Kg (1.3-8.2)	LDW-C8-T LDW-C7-T2 LDW-C7-T1 LDW-C1-T LDW-C2-T1 LDW-C2-T2 LDW-C10-T2 LDW-C10-T1 LDW-C5-T LDW-C3-T2 LDW-C3-T1 LDW-C9-T LDW-C6-T LDW-C4-T	J (all detects)	P
K2406517	SRM 1945	beta-BHC	2.1 ug/Kg (3.3-14)	LDW-C8-T LDW-C7-T2 LDW-C7-T1 LDW-C1-T LDW-C2-T1 LDW-C2-T2 LDW-C10-T2 LDW-C10-T1 LDW-C5-T LDW-C3-T2 LDW-C3-T1 LDW-C9-T LDW-C6-T LDW-C4-T	J (all detects) UJ (all non-detects)	P
K2407452 K2407596	SRM 1945	2,4'-DDD	42 ug/Kg (7.7-31)	LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T	J (all detects)	P
K2407452 K2407596	SRM 1945	beta-BHC	3.1 ug/Kg (3.3-14)	LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T	J (all detects) UJ (all non-detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Although florisil cleanup was not required by the method, it was performed by the laboratory for EPA Level IV.

Florisil cartridge check data were not reviewed for Level II.

b. GPC Calibration

Although GPC cleanup was not required by the method, it was performed by the laboratory for EPA Level IV.

GPC cleanup data were not reviewed for Level II.

XI. Target Compound Identification

All target compound identifications were within validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding	Flag	A or P
K2406232	LDW-B1a-T** LDW-B4a-T** LDW-B2a-T** LDW-B9b-T** LDW-B6a-T** LDW-B3b-T** LDW-B7b-T**	All detected compounds	Due to the presence of PCBs, all detected results were qualified as presumptive and estimated.	NJ (all detects)	A

Target compound identifications data were not reviewed for Level II.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria.

The sample results for detected compounds from the two columns were within 40.0% relative percent differences (RPD) with the following exceptions:

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2406232	LDW-B1a-T**	2,4'-DDD 2,4'-DDT	45 41	J (all detects) J (all detects)	A
K2406232	LDW-B9b-T**	gamma-Chlordane 4,4'-DDE	60 63	J (all detects) J (all detects)	A

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2406232	LDW-B6a-T**	beta-BHC 4,4'-DDT 2,4'-DDE	78 45 99	J (all detects) J (all detects) J (all detects)	A
K2406232	LDW-B3b-T**	gamma-Chlordane alpha-Chlordane Endrin ketone 2,4'-DDE	80 93 48 43	J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406232	LDW-B7b-T**	gamma-Chlordane Endosulfan II	48 46	J (all detects) J (all detects)	A
K2406297	LDW-B6b-T	4,4'-DDE 4,4'-DDT 2,4'-DDD 2,4'-DDT	48 63 91 63	J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C8-T	Heptachlor epoxide Endrin 2,4'-DDT	78 75 72	J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C7-T2	Hexachlorobenzene gamma-Chlordane Endrin aldehyde	79 45 71	J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C7-T1	Hexachlorobenzene beta-BHC 4,4'-DDE Endosulfan II 4,4'-DDT	45 45 86 95 55	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C1-T	beta-BHC gamma-Chlordane 4,4'-DDD 4,4'-DDT 2,4'-DDT	67 64 72 57 47	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C2-T1	Aldrin 4,4'-DDD 4,4'-DDT	77 41 43	J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C2-T2	Hexachlorobenzene beta-BHC Aldrin Endosulfan I 2,4'-DDD	63 69 94 54 58	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C10-T2	Hexachlorobenzene gamma-Chlordane Endrin 4,4'-DDT	84 98 69 41	J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C10-T1	gamma-BHC gamma-Chlordane Endrin Endosulfan II	86 96 77 52	J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C5-T	gamma-BHC Heptachlor epoxide Dieldrin 4,4'-DDE 2,4'-DDD	66 60 74 75 67	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A

*Indicates change as the result of report review.

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2406517	LDW-C3-T2	Hexachlorobenzene alpha-BHC beta-BHC Aldrin Dieldrin Endrin Methoxychlor 2,4'-DDD	46 92 54 80 97 83 80 44	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C3-T1	beta-BHC Heptachlor epoxide gamma-Chlordane Dieldrin 4,4'-DDE Endosulfan II 2,4'-DDD	93 42 58 41 75 95 91	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C9-T	Heptachlor epoxide gamma-Chlordane 4,4'-DDE 2,4'-DDD 2.4'-DDT	68 42 92 87 45	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C6-T	Hexachlorobenzene Heptachlor epoxide 4,4'-DDE Endrin 2,4'-DDD 2,4'-DDT	69 71 65 55 81 56	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406517	LDW-C4-T	Hexachlorobenzene beta-BHC 4,4'-DDE Endrin 2,4'-DDD 2,4'-DDT	51 41 98 62 80 64	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406581	LDW-B7a-T	Heptachlor epoxide 4,4'-DDE 2,4'-DDT	93 47 67	J (all detects) J (all detects) J (all detects)	A
K2406932	LDW-B8a-T	2,4'-DDD	49	J (all detects)	A
K2406932	LDW-B10a-T	Endosulfan I 2,4'-DDE	41 50	J (all detects) J (all detects)	A
K2407216	LDW-B3a-T	beta-BHC Endrin aldehyde	43 96	J (all detects) J (all detects)	A
K2407216	LDW-B9a-T	Heptachlor	48	J (all detects)	A
K2407452	LDW-B5a-T	2,4'-DDT	83	J (all detects)	A
K2407596	LDW-B4b-T	gamma-Chlordane 2,4'-DDT	55 57	J (all detects) J (all detects)	A
K2407596	LDW-B5b-T	Endrin ketone 2,4'-DDD	78 78	J (all detects) J (all detects)	A
K2407596	LDW-B1b-T	4,4'-DDE	90	J (all detects)	A

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2407596	LDW-B2b-T	2,4'-DDD 2,4'-DDT	60 71	J (all detects) J (all detects)	A

Compound quantitation and CRQLs data were not reviewed for Level II.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

*XIV. Field Duplicates

No field duplicates were identified in these SDGs.

XV. Field Blanks

No field blanks were identified in these SDGs.

Polychlorinated Biphenyls by EPA SW 846 Method 8082

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406232	LDW-B1a-T** LDW-B4a-T** LDW-B2a-T** LDW-B9b-T** LDW-B6a-T**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory, however the laboratory indicated that the samples were then immediately stored frozen.

II. GC/ECD Instrument Performance Check

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

Instrument performance check data were not reviewed for Level II.

III. Initial Calibration

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

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

Retention time windows were evaluated and considered technically acceptable.

Initial calibration data were not reviewed for Level II.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

The percent difference (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

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

Retention times (RT) of all compounds in the calibration standards were within QC limits.

Continuing calibration data were not reviewed for Level II.

V. Blanks

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

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there was insufficient sample for analysis of the matrix spike and matrix spike duplicate for SDGs K2406232, K2406297, K2406581, K2406932, K2407216, K2407452, and K2407596.

Percent recoveries (%R) and relative percent differences (RPD) were within QC limits in SDG K2406517.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits in SDG K2406517 and K2407596.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Although florisil cleanup was not required by the method, it was performed by the laboratory for EPA Level IV.

Florisil cartridge check data were not reviewed for Level II.

b. GPC Calibration

Although GPC cleanup was not required by the method, GPC cleanup was performed by the laboratory for EPA Level IV.

Although sulfuric acid cleanup was not required by the method, sulfuric acid cleanup was performed by the laboratory for EPA Level IV.

GPC and sulfuric acid cleanup data were not reviewed for Level II.

XI. Target Compound Identification

All target compound identifications were within validation criteria.

Target compound identifications data were not reviewed for Level II.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria.

The sample results for detected compounds from the two columns were within 40.0% relative percent differences (RPD) with the following exceptions:

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2406517	LDW-C8-T	Aroclor-1248	83.1	J (all detects)	A
K2406517	LDW-C7-T2	Aroclor-1248	91	J (all detects)	A
K2406517	LDW-C7-T1	Aroclor-1248	86	J (all detects)	A

Compound quantitation and CRQLs data were not reviewed for Level II.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

*XIV. Field Duplicates

No field duplicates were identified in these SDGs.

XV. Field Blanks

No field blanks were identified in these SDGs.

Metals by EPA SW 846 Methods 6010B/6020/7471A

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

Calibration data were not reviewed for Level II.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

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

Associated SDG	Method Blank ID	Analyte	Maximum Concentration	Associated Samples
K2406232	ICB/CCB	Cobalt Nickel	0.0187 ug/L 0.178 ug/L	LDW-B1a-T** LDW-B4a-T** LDW-B2a-T** LDW-B9b-T** LDW-B6a-T** LDW-B3b-T**
K2406232	ICB/CCB	Cobalt	0.0347 ug/L	LDW-B7b-T**

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

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

ICP Interference check sample analysis data were not reviewed for Level II.

V. Matrix Spike Analysis

The laboratory has indicated that there was insufficient sample for analysis of the matrix spike for SDGs K2406232, K2406297, K2406581, K2406932, K2407216, K2407452, and K2407596.

Percent recoveries (%R) were within QC limits in SDGs K2406517.

The laboratory has indicated that there was insufficient sample for analysis of the duplicate sample for SDGs K2406232, K2406297, K2406581, K2406932, K2407216 K2407452, and K2407596.

Results were within QC limits in SDG K2406517.

VII. Laboratory Control Samples (LCS)

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

Associated SDG	LCS ID (Associated Samples)	Analyte	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
K2406232 K2406581 K2407216	LCS/LCSD (LDW-B1a-T** LDW-B4a-T** LDW-B2a-T** LDW-B9b-T** LDW-B6a-T** LDW-B3b-T** LDW-B7b-T** LDW-B7a-T LDW-B3a-T LDW-B9a-T)	Silver	49 (60-130)	-	48 (≤30)	J (all detects) R (all non-detects)	P

Since silver was detected in all the associated samples, this finding did not warrant rejection (R) of the data.

Standard reference material were within QC limits for samples associated with SDG K2407452 and K2407596 for Mercury only.

No standard reference material analysis data were associated with the samples in SDG K2406232, K2406297, K2406581, K2406932, and K2407216 for all compounds.

No standard reference material analysis data were associated with the samples in SDG K2406517 for Antimony, Molybdenum, Thallium, and Vanadium.

No standard reference material analysis data were associated with the samples in SDG K2407452 and K2407596 for all ICP/MS metals.

VIII. Internal Standards (ICP-MS)

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

Internal standards data were not reviewed for Level II.

IX. Furnace Atomic Absorption QC

All graphite furnace atomic absorption QC were within validation criteria

*X. ICP Serial Dilution

ICP serial dilution analyses were reviewed for each matrix as applicable. The analysis criteria were met with the following exceptions:

Associated SDG	Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
K2406232 K2406581 K2407216	LDW-B5b-TL	Cadmium Cobalt Copper Silver	15 (≤10) 15 (≤10) 17 (≤10) 15 (≤10)	LDW-B1a-T** LDW-B4a-T** LDW-B2a-T** LDW-B9b-T** LDW-B6a-T** LDW-B3b-T** LDW-B7b-T** LDW-B7a-T LDW-B3a-T LDW-B9a-T	J (all detects) UJ (all non-detects)	A
K2406297 K2406932	LDW-B8a-TL	Cobalt Copper Nickel Silver	15 (≤10) 12 (≤10) 22 (≤10) 11 (≤10)	LDW-B6b-T LDW-B8b-T LDW-B10b-T LDW-B8a-T LDW-B10a-T	J (all detects) UJ (all non-detects)	A
K2406517	LDW-C2-T2L	Arsenic	11 (≤10)	LDW-C8-T LDW-C7-T2 LDW-C7-T1 LDW-C1-T LDW-C2-T1 LDW-C2-T2 LDW-C10-T2 LDW-C10-T1 LDW-C5-T LDW-C3-T2 LDW-C3-T1 LDW-C9-T LDW-C6-T LDW-C4-T	J (all detects) UJ (all non-detects)	A
K2407452 K2407596	LDW-B4b-TL	Cadmium Nickel	23 (≤10) 11 (≤10)	LDW-B5a-T LDW-B4b-T LDW-B5b-T LDW-B1b-T LDW-B2b-T	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

*Indicates change as the result of report review.

XI. Sample Result Verification

All sample result verifications met validation criteria.

Sample result verification data were not reviewed for Level II.

XII. Overall Assessment of Data

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

*XIII. Field Duplicates

No field duplicates were identified in these SDGs.

XIV. Field Blanks

No field blanks were identified in these SDGs.

Arsenic by EPA SW 846 Method 6020

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

Calibration data were not reviewed for Level II.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

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

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

ICP Interference check sample analysis data were not reviewed for Level II.

V. Matrix Spike Analysis

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits for SDG K2407455.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits for SDG K2407455.

VII. Laboratory Control Samples (LCS)

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

Standard reference material were within QC limits.

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

ICP-MS data were not reviewed for Level II.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in these SDGs.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

All sample result verifications met validation criteria.

Sample result verification data were not reviewed for Level II.

XII. Overall Assessment of Data

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

*XIII. Field Duplicates

No field duplicates were identified in these SDGs.

XIV. Field Blanks

No field blanks were identified in these SDGs.

Inorganic Arsenic by modified EPA Method 1632

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

Calibration data were not reviewed for Level II.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

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

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

ICP Interference check sample analysis data were not reviewed for Level II.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits for SDGs 04BR710 and 04BR739 with the following exceptions:

Associated SDG	Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
04BR739	B1-C-T4MS/MSD (B1-C-T1 B1-C-T2 B1-C-T3 B1-C-T4 B1-C-T5 B1-C-T6 SP-C-T1 SP-C-T2 SP-C-T3 SP-C-T4 SP-C-T5 SP-C-T6)	Inorganic arsenic	132.4 (75-125)	131.3 (75-125)	-	J+ (all detects)	A
04BR739	SP-C-T4MS/MSD (B1-C-T1 B1-C-T2 B1-C-T3 B1-C-T4 B1-C-T5 B1-C-T6 SP-C-T1 SP-C-T2 SP-C-T3 SP-C-T4 SP-C-T5 SP-C-T6)	Inorganic arsenic	-	135.5 (75-125)	-	J+ (all detects)	A

VI. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in SDGs 04BR710 or 04BR739, and therefore duplicate analyses were not performed for these SDGs.

VII. Laboratory Control Samples (LCS)

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

Standard reference material were within QC limits for SDG 04BR739.

Standard reference material were not performed for inorganic arsenic for SDG 04BR710.

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

ICP-MS data were not reviewed for Level II.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in these SDGs.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

All sample result verifications met validation criteria.

Sample result verification data were not reviewed for Level II.

XII. Overall Assessment of Data

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

XIII. Field Duplicates

No field duplicates were identified in these SDGs.

XIV. Field Blanks

No field blanks were identified in these SDGs.

Total Lipids by NOAA Method

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

Initial calibration data were not reviewed for Level II.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

Continuing calibration data were not reviewed for Level II.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

V. Duplicates/Triplicates

The laboratory has indicated that there was insufficient sample for analysis of the duplicate sample for SDGs K2406232, K2406297, K2406581, K2406932, and K2407216.

Duplicate (DUP) and triplicate (TRP) sample analyses were reviewed for each matrix as applicable in SDGs K2406517, K2407596 and K2407455. Relative percent differences (RPD) were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were not required by the method.

VII. Sample Result Verification

All sample result verifications met validation criteria.

Sample result verification data were not reviewed for Level II.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

*IX. Field Duplicates

No field duplicates were identified in these SDGs.

X. Field Blanks

No field blanks were identified in these SDGs.

GC Butyltins By Krone Method

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406232	LDW-B1a-T** LDW-B4a-T** LDW-B2a-T** LDW-B9b-T** LDW-B6a-T** LDW-B3b-T**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory, however the laboratory indicated that the samples were then immediately stored frozen.

II. Calibration

a. Initial Calibration

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

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

Retention time windows were evaluated and considered technically acceptable for samples on which EPA Level IV review was performed.

Initial calibration data were not reviewed for Level II.

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 25.0% QC limits.

The percent difference (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which EPA Level IV review was performed.

Continuing calibration data were not reviewed for Level II.

III. Blanks

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

IV. Accuracy and Precision Data

a. Surrogate Recovery

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

b. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there was insufficient sample for analysis of the matrix spike and matrix spike duplicate for SDGs K2406232, K2406297, K2406581, K2406932, K2407216, K2407452, and K2407596.

Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits in SDG K2406517. Since the sample concentration was greater than the spiked concentration, no data were qualified.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits in SDG K2406517.

c. Laboratory Control Samples

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

Standard reference material were within QC limits.

No standard reference material was analyzed for Tetra-n-butyltin.

V. Target Compound Identification

All target compound identifications were within validation criteria.

Target compound identifications data were not reviewed for Level II.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding	Criteria	Flag	A or P
K2406517	LDW-C8-T LDW-C7-T2 LDW-C7-T1 LDW-C1-T LDW-C2-T1 LDW-C2-T2 LDW-C10-T2 LDW-C10-T1 LDW-C5-T LDW-C3-T2 LDW-C3-T1 LDW-C9-T LDW-C6-T LDW-C4-T	Tri-n-butyltin	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

The sample results for detected compounds from the two columns were within 40.0% relative percent differences (RPD) with the following exceptions:

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2406517	LDW-C8-T	Di-n-butyltin	61	J (all detects)	A
K2406517	LDW-C9-T	Di-n-butyltin	93	J (all detects)	A
K2406517	LDW-C8-TDL	Di-n-butyltin	200	J (all detects)	A

Compound quantitation and CRQLs data were not reviewed for Level II.

VII. System Performance

The system performance was acceptable.

System performance data were not reviewed for Level II.

VIII. Overall Assessment of Data

The overall assessment of data was acceptable. In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Associated SDG	Sample	Compound	Flag	A or P
K2406517	LDW-C8-T LDW-C7-T2 LDW-C7-T1 LDW-C1-T LDW-C2-T1 LDW-C2-T2 LDW-C10-T2 LDW-C10-T1 LDW-C5-T LDW-C3-T2 LDW-C3-T1 LDW-C9-T LDW-C6-T LDW-C4-T	Tri-n-butyltin	R	A
K2406517	LDW-C1-T LDW-C2-T2 LDW-C10-T2 LDW-C10-T1 LDW-C5-T LDW-C3-T2 LDW-C9-T	Di-n-butyltin	R	A
K2406517	LDW-C8-TDL LDW-C7-T2DL LDW-C7-T1DL LDW-C2-T1DL LDW-C3-T1DL LDW-C6-TDL LDW-C4-TDL	All TCL compounds except Tri-n-butyltin	R	A
K2406517	LDW-C1-TDL LDW-C2-T2DL LDW-C10-T2DL LDW-C10-T1DL LDW-C5-TDL LDW-C3-T2DL LDW-C9-TDL	All TCL compounds except Tri-n-butyltin Di-n-butyltin	R	A

Data flags are summarized at the end of this report.

*IX. Field Duplicates

No field duplicates were identified in these SDGs.

X. Field Blanks

No field blanks were identified in these SDGs.

LDC #: 12662A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/2/04
SDG #: K2406232 Level IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: QV
2nd Reviewer: QV

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/10-15/04 Temp @ 11°C for 1-10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD. r^2
IV.	Continuing calibration	SW	%D & ICV
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates / DUP	N	insufficient samples
VIII.	Laboratory control samples	SW	LCS/D. no SRM
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	A	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	A	
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples
All Tissues

1	LDW-B1a-T	11	LDW-B3b-T	21	~~HW904KFTA5-3~~	31	
2	LDW-B1a-TRE	12	LDW-B3b-TRE	22		32	
3	LDW-B4a-T	13	LDW-B7b-T	23		33	
4	LDW-B4a-TRE	14	LDW-B7b-TRE	24		34	
5	LDW-B2a-T	15		25		35	
6	LDW-B2a-TRE	16		26		36	
7	LDW-B9b-T	17		27		37	
8	LDW-B9b-TRE	18		28		38	
9	LDW-B6a-T	19		29		39	
10	LDW-B6a-TRE	20		30		40	

LDC #: 13662A29
SDG #: K2406232

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: 9
2nd Reviewer: K

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	✓			
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?	✓		✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		✓		DUP
Was a MS/MSD analyzed every 20 samples of each matrix?		✓		

LDC #: 12660B29
SDG #: K240623

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: K

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 2-methyl-4,6-dinitrophenol
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12662A29
SDG #: 240623 2

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	10/4/24	1004F002	X	45		2.4.6.8.10.12	J/UJ/A
			11	28		14. HWF041474S-3	J
			TTT	32			

CONCAL.2S

C-1
70 of 310

LDC #: 1266A-2a
SDG #: k240623

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: a
2nd Reviewer: a

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/28/04 **Blank analysis date:** 10/1/04
Conc. units: ug/kg Associated Samples: all

Compound	Blank ID	Sample Identification								
	k4745-3	1	2	5	9	11	12			
A	22	(530)	(580)	(150)	(120)	(260)	(300)			

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12662A2a
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414T45-1/-2	NNN	19 (20-130)	( )	( )	All+Bk	J/UJ/P
			O	5 (↓)	6 (20-130)	( )		↓
			SSS	2 (↓)	1 (↓)	64 (≤ 50)		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 13623B2
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 6of 1
Reviewer: 9
2nd Reviewer: 9

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		1	~~A~~, ~~#~~	1	R/A
		2	M except A, #	2	
		3	PPP, V	3	
		4	M except PPP, V	4	
		5, 7, 9	PPP	5, 7, 9	
		6, 8, 10	M except PPP	6, 8, 10	
		11	A, QQQ, PPP	11	
		12	M except A, QQQ, PPP	12	

Comments: _____

LDC #: 12662A29
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		13	I. PPP	13	P/A
					↓
		14	All except I. PPP	14	

Comments: _____

LDC #: 13662A3a
SDG #: k240623

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: DK

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

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

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1000 std)	Recalculated RRF (1000 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/29/04	Phenol (1st internal standard)	0.959	0.959	0.910	0.910	12.1	12.1
			~~Naphthalene~~ (2nd internal standard)	0.476	0.476	0.474	0.474	10.3	10.2
			~~Fluorene~~ (3rd internal standard)	1.54	1.54	1.49	1.49	11.1	11.0
			Pertachlorophenol (4th internal standard)	0.126	0.126	0.155	0.155	15.3	15.2
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.657	0.657	0.636	0.636	13.9	13.9
			~~Benzo(a)pyrene~~ (6th internal standard)	1.32	1.32	1.31	1.31	8.4	8.4
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

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

LDC #: 26624-2A
SDG#: K2406232

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: 9

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

Parameter: Benzoic acid

Order of regression: Quad

DATE	GCMS ID	COLUMN	(Y) AREA RATIO	(X) CONC RATIO	(X^2) CONC RATIO
09/29/1994	MS14	CAP	0.14185	1.00	1.00
			0.32391	2.00	4.00
			0.51565	3.00	9.00
			0.90719	5.00	25.00
			1.54780	8.00	64.00
			1.94749	10.00	100.00

Regression Output:

Constant		-0.0516
Std Err of Y Est		0.0127
R Squared		0.9998122
No. of Observations		6
Degrees of Freedom		3
X Coefficient (s)	0.1860	0.0015
Std Err of Coef.	0.0078	0.0007
Correlation Coefficient (r) =		0.9999061
Coefficient of Determination (r^2) =		0.9998122

LDC #: F662A29
SDG #: K240623²

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: CA
2nd Reviewer: CA

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

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

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	1001F009	10/1/04	Phenol (1st internal standard)	0.910	1.04	1.04	14	14
			~~Naphthalene~~ (2nd internal standard)	0.474	0.413	0.413	13	13
			~~Fluorene~~ (3rd internal standard)	1.49	1.38	1.38	8	8
			Pentachlorophenol (4th internal standard)	0.155	0.144	0.144	7	7
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.636	0.615	0.615	3	3
			~~Benzo(a)pyrene~~ (6th internal standard)	1.31	1.41	1.41	8	8
2	1004F002	10/4/04	Phenol (1st internal standard)	0.910	1.06	1.06	16	16
			~~Naphthalene~~ (2nd internal standard)	0.474	0.432	0.432	9	9
			~~Fluorene~~ (3rd internal standard)	1.49	1.38	1.38	7	7
			Pentachlorophenol (4th internal standard)	0.155	0.159	0.159	3	3
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.636	0.692	0.692	9	9
			~~Benzo(a)pyrene~~ (6th internal standard)	1.31	1.41	1.41	8	7
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexy)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

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

LDC #: 12662A29
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: A
2nd reviewer: M

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

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	2500	2222	89	89	0
2-Fluorobiphenyl	↓	2076	83	83	↓
Terphenyl-d14	↓	2486	99	99	↓
Phenol-d5	3750	3610	96	96	↓
2-Fluorophenol	↓	3326	89	89	↓
2,4,6-Tribromophenol	↓	3476	93	93	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

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

Sample ID: _____

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

LDC #: 12662A29
SDG #: K2406232

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

Reviewer: 9
2nd Reviewer: K

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

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

% Recovery = 100 * (SC/SA Where: SSC = Spike concertration; SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboratory ccntrol sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: KWG0414745-1/-2

Compound	Spike Added (µg/L)		Spike Concentration (µg/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol	1000	1000	1030	911	103	103	91	91	12	12
2-Chlorophenol	↓	↓	921	804	92	92	80	80	14	14
1,4-Dichlorobenzene			788	686	79	79	69	69	14	14
N-Nitroso-di-n-propylamine			931	824	93	93	82	82	12	12
1,2,4-Trichlorobenzene			799	680	80	80	68	68	16	16
4-Chloro-3-methylphenol			917	802	92	92	80	80	13	13
~~Acenaphthene~~										
4-Nitrophenol	1000	1000	923	826	92	92	83	83	11	11
2,4-Dinitrotoluene	↓	↓	967	848	97	97	85	85	13	13
Pentachlorophenol	↓	↓	670	613	67	67	61	61	9	9
~~Pyrene~~										

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

LDC #: 13662A29
SDG #: 240623

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1 , A :

Conc. = $\frac{(21629)(1000)(4)(1)(\quad)}{(8828)(0.910)(2.02)(1)(\quad)}$

= 532.2 µg/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

RECALC.2S

LDC #: 12662B2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406297 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 1
2nd Reviewer: 2

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18-19/04
II.	GC/MS Instrument performance check	N	Not reviewed for Level II
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for Level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples
MS/TSSWPS

1	LWD-B6b-T	11	KWG0414745-3	21		31	
2	LWD-B6b-TRE	12		22		32	
3	LWD-B8b-T	13		23		33	
4	LWD-B8b-TRE	14		24		34	
5	LDW-B10b-T	15		25		35	
6	LDW-B10b-TRE	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 13662B29
SDG #: K2406297

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: CL
2nd Reviewer: MA

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/28/04 **Blank analysis date:** 10/1/04
Conc. units: ug/kg Associated Samples: MA

Compound	Blank ID	Sample Identification								
~~ENF604~~	14745-BS	3	1	3	4					
A	22	(160)	89/500U	99/500U						

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12662B29
SDG #: K240629T

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: q
2nd Reviewer: u

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

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

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414T-5-1/	NNN	19 (20-130)	( )	( )	All+Blk	J/UJ/P
		-2	O	5 (↓)	6 (20-130)	( )		
			SSS	2 (↓)	1 (↓)	64 (≤50)		↓
				( )	( )	( )		
				( )	( )	( )		
		No SRM		( )	( )	( )	All+Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12662B29
SDG #: k240629T

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		2	All	2	R/A
		3	A, PPP	3	R/A
		4	All except A, PPP	4	R/A
		5	PPP	5	
		6	All except PPP	6	

Comments:

LDC #: 12662C2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/20/04
SDG #: K2406517 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: ST
2nd Reviewer: W

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25-27/04
II.	GC/MS Instrument performance check	N	Not reviewed for Level II
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates / DUP	SW/SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for Level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	~~N~~ SW	~~D=3+6. 7+8, 2+3. 10+11+R~~
XVII.	Field blanks	N	

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

Validated Samples
M/Tissues

1	LDW-C8-T	11	LDW-C3-T1	21	KWG0413T84-S	31	
2	LDW-C7-T2	12	LDW-C9-T	22		32	
3	LDW-C7-T1	13	LDW-C6-T	23		33	
4	LDW-C1-T	14	LDW-C4-T	24		34	
5	LDW-C2-T1	15	LDW-C2-T2MS	25		35	
6	LDW-C2-T2	16	LDW-C2-T2MSD	26		36	
7	LDW-C10-T2	17	LDW-C2-T2DUP	27		37	
8	LDW-C10-T1	18		28		38	
9	LDW-C5-T	19		29		39	
10	LDW-C3-T2	20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12662C29
SDG #: 124061T

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		15/16	V	( )	132 (20-130	( )	6	dets/A
				( )	( )	( )		
		6/17	PPP	(<RL)	( )	63 (≤50)	6	No qual
			LL	( )	( )	64 ( )		
			EEE	( )	( )	NC ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 12662C29
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0413784-3/-4	O	16 (20-130)	( )	59 (≤50)	All + Blk	J/UJ/P
			PPP	7 (↓)	( )	118 (↓)		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		NbSRM	All	( )	( )	( )	All + Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12662D2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406581 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: Q
2nd Reviewer: DK

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C) ~~-~~ SIM)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
II.	GC/MS Instrument performance check	N	~~insufficient~~ Not reviewed for level II
III.	Initial calibration	N	↓
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level II
XI.	Target compound identification	N	↓
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B7a-T ~~Tissues~~ ↓	11	~~KWG0414745-3~~	21		31	
2	LDW-B7a-TRE	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 26620D29
SDG #: K240658|

VALIDATION FINDINGS WORKSHEET
Blanks

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

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

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

(Y) N N/A Was a method blank analyzed for each matrix?
(Y) N N/A Was a method blank analyzed for each concentration preparation level?
(Y) N N/A Was a method blank associated with every sample?
(Y) N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/28/04 **Blank analysis date:** 10/1/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
KWF04	KT453	1								
A	22	(120)								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 15662D2a
SDG #: K2406581

Page: 1 of 1
Reviewer: 9
2nd Reviewer: Q

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414745-1/	NNN	19 (20-130)	( )	( )	All + Bck	J/UJ/P
		-2	HO	5 ( )	6 (20-130)	( )		↓
			SSS	2 (↓)	1 (↓)	64 (≤50)		
				( )	( )	( )		
				( )	( )	( )		
		No SRM		( )	( )	( )	All + Bck	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 12662D29
SDG #: K2406581

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: a
2nd Reviewer: a

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		1	PPP, ✓	1	R/A
					↓
		2	all except PPP, ✓	2	↓

Comments: _____

OVR.2S

LDC #: 12662E2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/29/04
SDG #: K2406932 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: a
2nd Reviewer: K

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17-25/04
II.	GC/MS Instrument performance check	N	Not ~~uploaded~~ reviewed for level III
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not ~~yet~~ reviewed for level III
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B8a-T TISSUES	11	KWG0414745=3	21		31	
2	LDW-B8a-TRE	12		22		32	
3	LDW-B10a-T	13		23		33	
4	LDW-B10a-TRE	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12662E9a
SDG #: 240632

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9
2nd Reviewer: [illegible]

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/28/04 **Blank analysis date:** 10/1/04
Conc. units: ug/kg Associated Samples: all

Compound	Blank ID	Sample Identification								
LWG	14745-3									
A	22									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

BNA_blank.wpd

LDC #: 13662E29
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: K

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414745-1/	NNN	19 (20-130)	( )	( )	W+Bk	J/UJ/P
		/-2	O	5 (↓)	6 (20-130)	( )		↓
			SSS	2 (↓)	1 (↓)	64 (≤50)		
				( )	( )	( )		
		No SRM	M	( )	( )	( )	M+Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

LDC #: 12662E29
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		1, 3	PPP	1, 3	R/A
		2, 4	All except PPP	2, 4	

Comments: _____

LDC #: 12662F2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2407216 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: CF
2nd Reviewer:

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26-27/04
II.	GC/MS Instrument performance check	N	Not reviewed for level II
III.	Initial calibration	N	↓
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	SW N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	↓
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples
All Tissues

1	LDW-B3a-T	11		21		31	
2	LDW-B3a-TRE	12		22		32	
3	LDW-B9a-T	13		23		33	
4	LDW-B9a-TDL	14		24		34	
5	LDW-B9a-TRE	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12662F29
SDG #: K2407216

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9
2nd Reviewer: 8

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/8/04 **Blank analysis date:** 10/1/04
Conc. units: ug/kg Associated Samples: NA

Compound	Blank ID	Sample Identification								
	14745-3	1	2	3	5					
A	22	150	120	190	200					

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

BNA_blank.wpd

LDC #: 12662F29
SDG #: K2407216

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: q
2nd Reviewer: K

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414745-1/	NNN	19 (20-130)	( )	( )	All+Bk	J/UJ/P
		-2	O	5 (↓)	6 (20-130)	( )		↓
			SSS	2 (↓)	1 (↓)	64 (≤50)		↓
				( )	( )	( )		
				( )	( )	( )		
		No SRM	MM	( )	( )	( )	All + Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12662F29
SDG #: K240T216

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		3, 5	I > calib range	3, 5	√ dets/A

Comments: See sample calculation verification worksheet for recalculations

COMQUA.2S

LDC #: 12622F29
SDG #: K2407216

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: CL
2nd Reviewer: DK

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		1	I, PPP	1	R/A
		2	All except I, PPP	2	R/A
		3.	A, QQQ, I, PPP	3	
		5	~~All except I~~ All except A, QQQ, PPP	5	
		4	All except I	4	

Comments: _____

OVR.2S

LDC #: 12734A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/5/04
SDG #: K2407452 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	TW	
VI.	Surrogate spikes	TW	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	TW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B5a-T Tissue	11		21		31	
2	KWG0410318-5	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12734A29
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: T
2nd Reviewer: DR

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

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

(Y) N N/A Was a method blank analyzed for each matrix?
(Y) N N/A Was a method blank analyzed for each concentration preparation level?
(Y) N N/A Was a method blank associated with every sample?
(Y) N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/21/04 **Blank analysis date:** 11/3/04
Conc. units: 11/3/04 Associated Samples: MA

Compound	Blank ID	Sample Identification								
~~BNA~~	041618-5	1								
EEE	200	(2100)								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: [illegible]
SDG #: K2L0745²

VALIDATION FINDINGS WORKSHEET

Surrogate Recovery

Page: 1 of 1
Reviewer: 9
2nd Reviewer: R

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

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		KWG0416318-5	TPH	146 (20-130)	No Qual
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory

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

SUR.2S

LDC #: 12134A29
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 9K

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

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

Y N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG04 16318-3/-4	O	11 (20-130)	( )	102 (≤50)	M+Blk	√/M+/P
			EE	136 ( )	49 (20-130)	( )		√ dets/P
			WW	137 ( )	( )	( )		↓
			SSS	0 ( )	13 ( )	200 ( )		√/R/P
			AAA	214 ( )	212 ( )	( )		√ dets/P
			EEE	144 ( )	145 ( )	( )		↓
				( )	( )	( )		
				( )	( )	( )		
		No SRM		( )	( )	( )	M+Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12734D2a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407596 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: CL
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27-28/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient sample
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII	Field blanks	N	

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

Validated Samples

1	LDW-B4b-T Tissues	11	KNG0416318-5	21		31	
2	LDW-B5b-T	12		22		32	
3	LDW-B1b-T	13		23		33	
4	LDW-B2b-T	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12T34D29
SDG #: K240T596

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 8

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/21/04 **Blank analysis date:** 11/8/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
[redacted]	041618-5		All							
EEE	200		>5X							

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

SDG #: K2407596
Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		KWG0416318-5	TPH	146 (20-130)	No Qual
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory

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

SUR.2S

LDC #: 12134D-9
SDG #: k2407596

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: VC

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

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

Y N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0416318-3/-4	O	11 (20-130)	( )	102 (≤50)	M+Blk	J/UJ/P
			EE	136 ( )	149 (20-130)	( )		J dets/P
			WW	137 ( )	( )	( )		↓
			SSS	0 ( )	13 ( )	200 ( )		J/R/P
			AAA	214 ( )	212 ( )	( )		J dets/P
			EEE	144 (↓)	145 (↓)	( )		↓
				( )	( )	( )		
		No SRM		( )	( )	( )	M+Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12662A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/2/04
SDG #: K2406232 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: 2

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/10-15/04 cooler Temp 11°C 1-10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	TOD & ICV
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	N	insufficient samples
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	A	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples:
MPTBSWDS

1	LDW-B1a-T	11	LDW-B3b-T	21		31	
2	LDW-B1a-TRE	12	LDW-B3b-TRE	22		32	
3	LDW-B4a-T	13	LDW-B7b-T	23		33	
4	LDW-B4a-TRE	14	LDW-B7b-TRE	24		34	
5	LDW-B2a-T	15		25		35	
6	LDW-B2a-TRE	16		26		36	
7	LDW-B9b-T	17		27		37	
8	LDW-B9b-TRE	18		28		38	
9	LDW-B6a-T	19		29		39	
10	LDW-B6a-TRE	20		30		40	

LDC #: 12662A2b
SDG #: K2406232

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: 4

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	✓			
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		✓		
Was a MS/MSD analyzed every 20 samples of each matrix?		✓		

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.				
Target compounds were detected in the field duplicates.				
XVII. Field blanks				
Field blanks were identified in this SDG.				
Target compounds were detected in the field blanks.				

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 26242b
SDG #: k2406232

VALIDATION FINDINGS WORKSHEET
Blanks

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

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

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

(Y) N N/A Was a method blank analyzed for each matrix?
(Y) N N/A Was a method blank analyzed for each concentration preparation level?
(Y) N N/A Was a method blank associated with every sample?
(Y) N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/29/04 **Blank analysis date:** 10/6/04
Conc. units: ug/kg Associated Samples: MI

Compound	Blank ID	Sample Identification								
LOWEST CAL 14844-3		MI								
3	0.58									
Biphenyl	0.14									
YY	0.0T2		>5X							
ZZ	0.11									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 13662A2b
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		~~SRM~~ No SRM	S, W,	DD, JJ, GG,	NN, VV, KKK	( )	M+Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 13662A2b
SDG #: k2l0623 2

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: DE

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

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

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (600 std)	Recalculated RRF (600 std)	Reported Average RRF (Initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/5/14	Phenol (1st internal standard)						
			Naphthalene (2rd internal standard)	1.20	1.20	1.31	1.31	17.2	17.2
			Fluorene (3rd internal standard)	1.60	1.60	1.68	1.68	12.2	12.2
			~~Pentachlorophenol~~ (4th internal standard)	1.33	1.33	1.45	1.45	17.5	17.6
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard)	1.63	1.63	1.77	1.77	18.8	18.8
			Benzo(a)pyrene (6th internal standard)	1.48	1.48	1.41	1.41	6.7	6.6
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)	1.19	1.19	1.22	1.22	10.5	10.6
			Fluorene (3rd internal standard)	1.59	1.59	1.61	1.61	7.1	7.0
			~~Pentachlorophenol~~ (4th internal standard)	1.34	1.34	1.36	1.36	9.9	10.0
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard)	1.79	1.79	1.83	1.83	13.1	13.2
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

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

LDC #: 13662A2h
SDG #: K2406233

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: CS
2nd Reviewer: DC

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

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

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	1006F003	10/6/07	Phenol (1st internal standard)	~~1.31~~ D				
			Naphthalene (2nd internal standard)	1.68 1.31	1.08	1.08	18	18
			Fluorene (3rd internal standard)	1.45 1.68	1.41	1.41	16	16
			~~Pentachlorophenol~~ (4th internal standard)	~~1.77~~ 1.45	1.17	1.17	19	19
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard)	1.77	1.46	1.46	18	18
			Benzo(a)pyrene (6th internal standard)	1.41	1.31	1.31	7	7
2	1012F002	10/12/07	Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)	1.22	1.10	1.10	10	10
			Fluorene (3rd internal standard)	1.61	1.45	1.45	10	10
			~~Pentachlorophenol~~ (4th internal standard)	1.36	1.19	1.19	12	12
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard)	1.83	1.56	1.56	15	15
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

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

LDC #: 12662A-b
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: a
2nd reviewer: CV

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

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ NN-d10	2000	1457	73	73	0
2-Fluorobiphenyl XY-d10	↓	1613	81	81	↓
Terphenyl-d14 TPH	↓	1827	91	91	↓
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
~~1,2-Dichlorobenzene-d4~~					

Sample ID: _____

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

Sample ID: _____

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

LDC #: 13662A2b
SDG #: k240623

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

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

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

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

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration; SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: KWG0414814-1/-2

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
~~Phenol~~ GG	500	500	240	436	48	48	87	87	<	
2-Chlorophenol 22	V	V	425	521	85	85	104	104		
1,4-Dichlorobenzene										
N-Nitroso-di-n-propylamine										
1,2,4-Trichlorobenzene										
4-Chloro-3-methylphenol										
Acenaphthene										
4-Nitrophenol										
2,4-Dinitrotoluene										
Pentachlorophenol										
~~Pyrene~~										

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

LDC #: 12662A20
SDG #: K210623-2

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: a
2nd reviewer: h

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

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1, 3:

$$\text{Conc.} = \frac{(1812)(1000)(1)(1)(\quad)}{(13588)(1.3)(2.02)(1)(\quad)}$$

$= 5.04\ \mu g/kg$

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

RECALC.2S

LDC #: 12662B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406297 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) (Target PAHs + Target alkylated PAHs homologs)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18-19/04
II.	GC/MS Instrument performance check	N	Not reviewed for level II
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	~~SW~~ A	LCS/D. SRM
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples:
All Tissues

1	LWD-B6b-T	11	KWG0414844-3	21		31	
2	LWD-B6b-TRE	12	KWG0414844-3RE	22		32	
3	LWD-B8b-T	13		23		33	
4	LWD-B8b-TRE	14		24		34	
5	LDW-B10b-T	15		25		35	
6	LDW-B10b-TRE	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniiine
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12662B2b
SDG #: K240629T

VALIDATION FINDINGS WORKSHEET
Blanks

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

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/29/04 **Blank analysis date:** 10/6/04
Conc. units: ug/Kg Associated Samples: ALL

Compound	Blank ID	Sample Identification								
~~KNOWN~~	14844-3	~~#1~~	1,3,5							
S	0.58									
Biphenyl	0.14		>5X							
YY	0.072									
ZZ	0.11									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: [illegible]
SDG #: K2406229T

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

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

Y N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S.W. DD. JJ. GG	)	NN. VV. KK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LCSLCSD.2S

LDC #: 12662C2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406517 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 2
2nd Reviewer: W

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 - 27/04
II.	GC/MS Instrument performance check	N	Not reviewed for level II
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates/DUP	A/A	
VIII.	Laboratory control samples	SW	LCS/D. SRM.
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	~~te~~ Not reviewed for level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N SW	~~2+3~~ D2~~+3~~ ~~+~~6,7+8, ~~10+11~~R
XVII.	Field blanks	N	

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

Validated Samples:
All Tissues

1	LDW-C8-T	11	LDW-C3-T1	21	KWG0413793-5	31	
2	LDW-C7-T2	12	LDW-C9-T	22		32	
3	LDW-C7-T1	13	LDW C6 T	23		33	
4	LDW-C1-T	14	LDW-C4-T	24		34	
5	LDW-C2-T1	15	LDW-C2-T2MS	25		35	
6	LDW-C2-T2	16	LDW-C2-T2MSD	26		36	
7	LDW-C10-T2	17	LDW-C2-T2DUP	27		37	
8	LDW-C10-T1	18		28		38	
9	LDW-C5-T	19		29		39	
10	LDW-C3-T2	20		30		40	

12662C2bW.wpd

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VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12662C2b
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [illegible]
2nd Reviewer: AR

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/13/04 **Blank analysis date:** 10/5/04
Conc. units: _____ Associated Samples: NA

Compound	Blank ID	Sample Identification								
KWG#	13T93-5	1	2	3	4	5	6	7	8	9
S	0.33	1.6/U	0.80/0.99U	0.90/0.99U	0.79/1.0U	0.71/1.0U	0.83/1.0U	0.59/1.0U	0.57/0.99U	0.96/1.0U
YY	0.073	(120)	(84)	(88)	(57)	(48)	(58)	(37)	(34)	(110)

Blank extraction date: [illegible] **Blank analysis date:** _____
Conc. units: Sand Associated Samples: NA

Compound	Blank ID	Sample Identification								
KWG#	13T93-5	10	11	12	13	14				
S	0.33	0.91/1.0U	0.83/1.0U	0.78/1.0U	0.80/1.0U	1.0/U				
YY	0.073	(74)	(74)	(74)	(62)	(65)				

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

BNA_blank.wpd

LDC #: [illegible]
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?
[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S. W.	DD. JJ. GG)	NN, VV. KKK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LCSLCSD.2S

LDC #: 12662D2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406581 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
II.	GC/MS Instrument performance check	N	Not reviewed for level III
III.	Initial calibration	N	↓
IV.	Continuing calibration	N	↓
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	A/SW	LCS/D. SRM.
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level III
XI.	Target compound identification	N	↓
XII.	Compound quantitation/CRQLs	N	↓
XIII.	Tentitatively identified compounds (TICs)	N	↓
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples:

1	LDW-B7a-T Tissues	11		21		31	
2	LDW-B7a-TRE ↓	12		22		32	
3	KWG0414844-3	13		23		33	
4	KWG0414844-3RE	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniiine
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12662D2b
SDG #: k240658

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/29/04 **Blank analysis date:** 10/6/04
Conc. units: ug/kg Associated Samples: ~~All~~ 1

Compound	Blank ID	Sample Identification								
~~Unknown~~	1484-3	1								
S	0.58									
Biphenyl	0.14									
XX	0.072	5X								
ZZ	0.11									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #:
SDG #: K240658

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?
[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S.W,	DD. JJ. GG)	NN, VV. KK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
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				( )	( )	( )		

LDC #: 12662E2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406932 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 1
2nd Reviewer: 2

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17-25/04
II.	GC/MS Instrument performance check	N	Not reviewed for level III
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	A SW	LCS/D. SRM.
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level III
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples:
All Tissues

1	LDW-B8a-T	11	KWG0414844-3	21		31	
2	LDW-B8a-TRE	12	KWG0414844-3RE	22		32	
3	LDW B10a T	13		23		33	
4	LDW-B10a-TRE	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniiine
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12662E2b
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/29/04 **Blank analysis date:** 10/6/04
Conc. units: ug/kg Associated Samples: 2, 4

Compound	Blank ID	Sample Identification								
~~KWG0414844-~~ 3	2.4									
S	0.58									
Biphenyl	0.14		>5x							
YY	0.072									
ZZ	0.11									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: [illegible]
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?
[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S, W,	DD. JJ. GG)	NN, VV. KK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12662F2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2407216 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: 9

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26-27/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient samples
VIII.	Laboratory control samples	A SW	LCS/D. SRM.
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples:
All Tissues

1	LDW-B3a-T	11	KWG0414844-3	21		31	
2	LDW-B3a-TRE	12	KWG0414844-3 RE	22		32	
3	LDW-B9a-T	13		23		33	
4	LDW-B9a-TRE	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12662F2b
SDG #: k2407216

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: CA
2nd Reviewer: AC

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/29/04 **Blank analysis date:** 10/6/04
Conc. units: ug/kg Associated Samples: ~~All~~ 2, 4

Compound	Blank ID	Sample Identification								
LMW	414844-3	2, 4								
S	0.58									
Biphenyl	0.14									
YY	0.072	>5X								
ZZ	0.11									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: [illegible]
SDG #: K2407216

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S.W.	DD.JJ.GG)	NN, VV. KKK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LCSLCSD.2S

LDC #: 12734A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407452 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C) SIM + Alkylated PAHs

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	TW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	N	insufficient sample.
VIII.	Laboratory control samples	A SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B5a-T Tissue	11		21		31	
2	KWF0416322-5	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 13734A2b
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: K

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/21/04 **Blank analysis date:** 11/4/04
Conc. units: ug/kg Associated Samples: all

Compound	Blank ID	Sample Identification								
~~kinG~~	416322-5	1								
S	0.42	(T3								
Biphenyl	0.20	3.1)								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 21540D
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: q
2nd Reviewer: &

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N [✓ N/A] Was a LCS required?
Y N [✓ N/A] Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S, W,	DD, JJ, GG)	NN, VV, KKK	( )	All + Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

LCSLCSD.2S

LDC #: 12734D2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407596 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: M

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C) ~~SIM~~ + Alkylated PAHs

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27-28/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	insufficient sample.
VIII.	Laboratory control samples	~~A~~ SW	LCS 7
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B4b-T	11	KWG0416322-5	21		31	
2	LDW-B5b-T	12		22		32	
3	LDW-B1b-T	13		23		33	
4	LDW-B2b-T	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12734 D2h
SDG #: K240T595

VALIDATION FINDINGS WORKSHEET
Blanks

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

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/21/04 **Blank analysis date:** 11/4/04
Conc. units: ug/L Associated Samples: All

Compound	Blank ID	Sample Identification								
~~1,4-DCB~~	041022-5	1	1							
8	0.42		5X							
Biphenyl	0.20									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

SDG #: K2407596

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S.W,	DD.JJ.GG)	NN,VV.KKK	( )	All+Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12662A3a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/28/04
SDG #: K2406232 Level IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: E
2nd Reviewer: C

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/10 - 8/15/04
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	N	ICV ≤ 15
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	~~None~~ insufficient sample
VIII.	Laboratory control samples / SRM	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	Florisil clean up + GPC
Xb.	GPC Calibration	N	clean-up performed
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	SW A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples: Tissue

1	LDW-B1a-T	11	KWG0414867-5	21		31	
2	LDW-B4a-T	12		22		32	
3	LDW-B2a-T	13		23		33	
4	LDW-B9b-T	14		24		34	
5	LDW-B6a-T	15		25		35	
6	LDW-B3b-T	16		26		36	
7	LDW-B7b-T	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes:_____

LDC #: 12662A3a
SDG #: K2406232

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: B
2nd Reviewer: E

Method: Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.		✓		
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) $\leq$ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	✓			
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were the RT windows properly established?	✓			
Were the required standard concentrations analyzed in the initial calibration?				
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ___%D or ___%R	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?	✓			
Were endrin and 4,4'-DDT breakdowns $\leq$ 15%.0 for individual breakdown in the Evaluation mix standards?	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) $\leq$ 15%.0 or percent recovieries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Were extract cleanup blanks analyzed with every batch requiring clean-up?			✓	
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	✓			
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			✓	
Was a MS/MSD analyzed every 20 samples of each matrix?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 12662A3a
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

METHOD : GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1→5	tissue	no	cooler temp = 11°C				J/UJ/A

TECHNICAL HOLDING TIME CRITERIA

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

LDC #: 12662A3a
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: / GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
~~Y~~ N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	~~%D~~ %RPD Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	2,4-DDD	1	45	J/A det
	2,4-DDT	↓	41	↓
	T	4	60	
	J	↓	63	↓
	B	5	78	
	θ	↓	45	↓
	2,4-DDE		99	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12062A3a
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

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

Level IV/D Only

(Y) N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N (N/A) Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
(Y) N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	T	~~8~~ 6	80	J/A det
	S	↓	93	↓
	Q	↓	48	↓
	2,4-DDE	↓	43	↓
	T	7	48	J/A det
	L	↓	46	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662A3a
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

METHOD: GC ____ / HPLC ____

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

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (50 std)	Recalculated CF (50 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	CAL3865 DB-XLB	10/1/04	endosulfan I	3.04×10^5	3.04×10^5	313000	313000	9.6	9.6
			methoxychlor	1.53×10^5	1.53×10^5	161000	161000	15.0	15.0
2	CAL3865 DB-35MS	10/1/04	↓	4.98×10^5	4.98×10^5	515000	515000	13.4	13.4
				2.89×10^5	2.89×10^5	300000	300000	15.4	15.4
3									
4									

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

INICIAL ISB

LDC #: 12662 A39
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Target Compound Identification

Reviewer: FM
2nd Reviewer:

METHOD: ✓ GC __ HPLC

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

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

#	Sample ID	Column / Detector	Compound	RT (Limits)	Qualifications
				( )	
	All	Due to the	presence of	PCB, all detected results	N/A detect
			were	qualified as presumptive	
				( )	
				( )	
				( )	NJ/A det
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

Comments:

LDC #: 12662A3a
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:
2nd Reviewer:

METHOD: GC ✓ HPLC ____

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

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	10088F018	10/8/04	endosulfan I	313000	297000	292000	5	5
	DB-XLB		methoxychlor	161000	138000	138000	14	14
2	DB-35MS	10/8/04	↓	515000	499000	499000	3	3
				30000	260000	260000	13	13
3								
4								

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

LDC #: 12662A3a
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene	DB-XLB	100	79.0	79	79	0
Decachlorobiphenyl	↓	↓	67.97	68	68	0
Decachlorobiphenyl						

Sample ID:

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

Sample ID:

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

Sample ID:

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

Notes:

LDC #: 12662A3a
SDG #: K2406232

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

Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

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

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Concentration

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

LCS = Laboratory control sample percent recovery; LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: KWG0414867-1/2

Compound	Spike Added (ng/kg)		Sample Concentration (ng/kg)	Spiked Sample Concentration (ng/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	-	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Gamma-BHC	20.0	20.0	~~17.4~~ 0	17.4	15.6	87	87	78	78	11	11
Heptachlor	↓	↓	↓	16.3	14.4	82	82	72	72	13	12.4
Aldrin				16.7	14.7	83	83	74	74	13	13
Dieldrin				16.5	14.7	82	82	73	73	12	12
Endrin				17.2	15.6	86	86	78	78	10	10
4,4'-DDT				16.4	14.8	82	82	74	74	10	10

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

LDC #: 12667A30
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: B
2nd reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Example:

Sample I.D. #1 4,4'-DDT

Conc. = (1169964 x 14) / (523000 2.02)

=

4.4 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Note:

LDC #: 12662B3a
SDG #: K2406297
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 10/27/04
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18 - 8/19/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	N	~~not 1+2~~ insufficient sample
VIII.	Laboratory control samples /SRM	A/A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	~~SW~~ N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples: Tissue

1	~~LWD~~ LDW-B6b-T	11	KWG0414867-5	21		31	
2	~~LWD~~ LDW-B8b-T	12		22		32	
3	~~LDW~~ LDW-B10b-T	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12662B3a
SDG #: K2406297

VALIDATION FINDINGS WORKSHEET

Page: 1 of 1
Reviewer: B
2nd Reviewer:

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes:

LDC #: 12662B3a
SDG #: K2406297

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

Y N N/A Were surrogates spiked into all samples, standards and blanks?

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

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		3	not specified	TCMX	156 (30-150)	Jdetect/P
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
				TCMX = Tetrachloro-m-xylene		
					( )	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A				
B				

SUR.3S

LDC #: 12662B3a
SDG #: K2406297

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding (% RPD Between 2 columns ≤ 40)	Associated Samples	Qualifications
	J	48	1	J/A det
	Θ	63		
	2,4'-DDD	91		
	2,4'-DDT	63		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662C3a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/04
SDG #: K2406517 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 – 8/27/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates / DUP	SW / SW A	
VIII.	Laboratory control samples / SRM	A / SW	
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	~~SW~~ N	D= 2+3, 5+6, 7+8, 10+11
XV.	Field blanks	N	

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

Validated Samples: Tissue

1+	LDW-C8-T	11	LDW-C3-T1	21	KW 904137 12-9	31	
2	LDW-C7-T2	12	LDW-C9-T	22		32	
3	LDW-C7-T1	13	LDW-C6-T	23		33	
4	LDW-C1-T	14	LDW-C4-T	24		34	
5	LDW-C2-T1	15	LDW-C2-T2MS	25		35	
6	LDW-C2-T2	16	LDW-C2-T2MSD	26		36	
7	LDW-C10-T2	17	LDW-C2-T2 DUP	27		37	
8	LDW-C10-T1	18		28		38	
9	LDW-C5-T	19		29		39	
10	LDW-C3-T2	20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes:_____

LDC #: 12662C3a
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer: JB
2nd Reviewer: CR

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

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

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		3	not specified	DCB	41 (30-150)	J/UJ/P
					( )	
		5	↓	↓	42 (30-150)	↓
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
				DCB= Decachlorobiphenyl		

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A				
B				

LDC #: 12662C3a
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		15+16	H	( )	49 (30-150)	( )	6	J/UJ/A
			R	32 (30-150)	29 (30-150)	( )	↓	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12662C3a
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples~~ SRM

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

[✓ Y] N N/A Were a ~~laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?~~ SRM

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

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

#	Date	SRM ~~LCS/LCSD ID~~	Compound	~~LCS~~ SRM ~~%R (Limits)~~ ng/kg	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		SRM 1945	C	16 (1.3-8.2)	( )	( )	All + Blk	Jdet/P
			B	2.1 (3.3-14)	( )	( )	↓	J/UJ/P
				( )	( )	( )		
				( )	( )	( )		
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LDC # 12662C3a
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	% RPD Between 2 column Finding ≤ 40	Associated Samples	Qualifications
	G	78	1	J / A det
	K	75	↓	↓
	2,4 DDT	72	↓	↓
	Hexachlorobenzene	79	2	↓
	T	45	↓	
	R	71	↓	
	Hexachlorobenzme	45	3	↓
	B	45	↓	
	J	86	↓	
	L	95	↓	
	O	55	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 26623a
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: / GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

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

#	Compound Name	% RPD Between 2 columns ≤ 40 Finding	Associated Samples	Qualifications
	B	67	4	J/A det
	T	64		
	M	72		
	O	57		
	2,4'-DDT	47		
	F	77	5	J/A det
	M	41		
	O	43		
	Hexachlorobenzene	63	6	
	B	69		
	F	94		
	H	54		
	2,4'-DDD	58		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662C3a
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: B
2nd Reviewer: AC

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

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

#	Compound Name	% RPD Between 2 column Finding	Associated Samples	Qualifications
	Hexachlorobenzene	84	~~7~~ → #7	J/A det
	T	98	↓	↓
	K	69		
	O	41	↓	↓
	D	86	8	
	T	96	↓	↓
	K	77		
	L	52	↓	↓
	D	66	9	
	G	60	↓	↓
	I	74		
	J	75	↓	↓
	~~R~~ 2,4'-DDD	67	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662C3a
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ~~GC~~ __ HPLC

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

Level IV/D Only

Y N ~~N/A~~ Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

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

#	Compound Name	Finding (% RPD Between 2 column ≤ 40)	Associated Samples	Qualifications
	Hexachlorobenzene	46.	10	J/A det
	A	92		
	B	54		
	F	80		
	I	97		
	K	83		
	P	80		
	2,4'-DDD	44		
	B	93	11	J/A det
	G	42		
	T	58		
	I	41		
	J	75		
	L	95		
	2,4'-DDD	91		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662C3a
SDG #: K240517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ~~GC~~ __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	%RPD Between 2 column Finding ≤ 40	Associated Samples	Qualifications
	G	68	12	J/A dut
	T	42		
	J	92		
	2,4'-DDD	87		
	2,4'-DDT	45		
	Hexachlorobenzene	69	13	J/A dut
	G	71		
	J	65		
	K	55		
	2,4'-DDD	81		
	2,4'-DDT	56		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662C3a
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

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

#	Compound Name	~~%RPD~~ %RPD between 2 columns ≤ 40 Finding	Associated Samples	Qualifications
	Hexachlorobenzene	51	14	J/A qut
	B	41		
	J	98		
	K	62		
	2,4'-DDD	80		
	2,4'-DDT	64	↓	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662D3a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/04
SDG #: K2406581 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	~~none~~ insufficient sample
VIII.	Laboratory control samples / SRM	A/A	LCS ID
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples: Tissue

1	LDW-B7a-T	11	KWG0414867-5	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12662D3a
SDG #: K2406581

VALIDATION FINDINGS WORKSHEET

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes:

LDC #: 12662D3a
SDG #: K2406581

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: GC HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD %D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	G	1	93	J/A act
	J	↓	47	↓
	2,4'-PDT	↓	67	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662E3a
SDG #: K2406932
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 10/27/04
Page: 1 of 1
Reviewer: JS
2nd Reviewer: JC

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17 → 30/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	~~and R~~ insufficient sample
VIII.	Laboratory control samples / SRM	A/A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples: Tissue

1	LDW-B8a-T	11	KWG0414867-5	21		31	
2	LDW-B10a-T	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes:_____

LDC #: 12662E3a
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: EJ
2nd Reviewer: K

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

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

#	Compound Name	Finding (% RPD Between 2 column ≤40)	Associated Samples	Qualifications
	2,4'-DDD	49	1	J/A act
	H	41	2	J/A act
	2,4'-DDE	50		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662F3a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/04
SDG #: K2407216 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: R
2nd Reviewer: R

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26 – 8/27/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	~~[illegible]~~ insufficient sample
VIII.	Laboratory control samples /SRM	A/A	
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples:

Tissue

1	LDW-B3a-T	11	KWG0414867-5	21		31	
2	LDW-B9a-T	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes: _____

LDC #: 12662F3a
SDG #: K24072/6

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	% RPD Between 2 column ≤40 Finding	Associated Samples	Qualifications
	B	43	1	J/A det
	R	96	↓	↓
	E	48	2	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12734A3a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407452 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DUP/	N/A	NO MS/MSD insufficient sample) LDW-B5b-T DUP
VIII.	Laboratory control samples /SRM	A/SW	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples: Tissue

1 +	LDW-B5a-T	11		21		31	
2	KWG0416041-7	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes:_____

LDC #: 12734A3a
SDG #: K240745 2

VALIDATION FINDINGS WORKSHEET
Blanks

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

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

(Y) N N/A Were all samples associated with a method blank?
(Y) N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N (N/A) If extract clean-up was performed, were extract clean-up blanks analyzed at the proper frequencies?
(Y) N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank extraction date: 10/15/04 **Blank analysis date:** 10/27/04 **Associated samples:** All (MD)
Conc. units: ug/kg

Compound	Blank ID	Sample Identification								
	KWG0416041-7									
P	0.81									

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

Compound	Blank ID	Sample Identification								

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

LDC #: 12734A3a
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples~~ SRM

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

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

[✓ Y] N N/A Were a ~~laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?~~ SRM

Y [✓ N] N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ SRM Recovery within limit ?

Level IV/D Only

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

#	Date	SRM ~~LCS/LCSD ID~~	Compound	~~LCS~~ SRM ug/kg ~~%R~~ (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		SRM 1945	2,4'-DDD	42 (7.7-31)	( )	( )	All + BlK	Jdet/P
			B	3.1 (3.3-14)	( )	( )	↓	↓/NJ/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12734A 3a
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: ___ GC ___ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

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

#	Compound Name	Finding (%RPD Between 2 column)	Associated Samples	Qualifications
	2,4'-DDT	83	1	J/A det

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12734D3a
SDG #: K2407596
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/15/04
Page: 1 of 1
Reviewer: FR
2nd Reviewer: FR

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27 - 9/28/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates / DUP	N / A	NO MS/MSD insufficient sample
VIII.	Laboratory control samples / SRM	A / SW	
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples:

1	LDW-B4b-T (Tissue)	11	KWG0416041-7	21		31	
2	LDW-B5b-T	12		22		32	
3	LDW-B1b-T	13		23		33	
4	LDW-B2b-T	14		24		34	
5	LDW-B5b-TDUP	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes: _____

LDC #: 12734D3a
SDG #: K2407596

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A If extract clean-up was performed, were extract clean-up blanks analyzed at the proper frequencies?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank extraction date: 10/15/04 **Blank analysis date:** 10/27/04 **Associated samples:** 1-4
Conc. units: ug/kg

Compound	Blank ID	Sample Identification								
	KWG0416041-7	3								
P	0.81		(6.3)							

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

Compound	Blank ID	Sample Identification								

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

LDC #: 12734D3a
SDG #: K2467596

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples~~ SRM

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? ________

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

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

#	Date	SRM ~~LCS/LCSD ID~~	Compound	ug/Kg ~~LCS~~ SRM %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		SRM 1945	2,4'-DDD	42 (7.7-31)	( )	( )	All + Blk	Jdet/P
			B	3.1 (3.3-14)	( )	( )	↓	J/UJ/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 12734B39
SDG #: K240759L

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: GC ___ HPLC

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

Level IV/D Only

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

#	Compound Name	Finding (%RPD Between 2 column ≤40)	Associated Samples	Qualifications
	T	55	#1	J/A det
	2,4'-DDT	57	↓	
	Q	78	#2	↓
	2,4'-DDD	78	↓	↓
	J	90	#3	↓
	2,4'-DDD	60	#4	↓
	2,4'-DDT	71	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662A3b
SDG #: K2406232
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 10/20/04
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/10 - 8/15/04
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration	A	ICV ≤ 15
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N/A	~~none~~ LP insufficient sample
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	GPC, Florisil + sulfuric
XI.	Target compound identification	A	acid clean ups performed
XII.	Compound quantitation and reported CRQLs	A	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples:

TISSUE

1 +	LDW-B1a-T	11	KWG0414868-3	21		31	
2 -	LDW-B4a-T	12		22		32	
3 +	LDW-B2a-T	13		23		33	
4 +	LDW-B9b-T	14		24		34	
5 +	LDW-B6a-T	15		25		35	
6 +	LDW-B3b-T	16		26		36	
7 +	LDW-B7b-T	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12662A36
SDG #: K2406232

VALIDATION FINDINGS CHECKLIST

Reviewer: JF
2nd Reviewer: K

Method: Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were the RT windows properly established?	✓			
Were the required standard concentrations analyzed in the initial calibration?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ✓ %D or ___ %R	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?			✓	
Were endrin and 4,4'-DDT breakdowns ≤ 15%.0 for individual breakdown in the Evaluation mix standards?			✓	
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%.0 or percent recovieries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Were extract cleanup blanks analyzed with every batch requiring clean-up?			✓	
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

LDC #: 12662A36
SDG #: K2406232

VALIDATION FINDINGS CHECKLIST

Reviewer: F
2nd Reviewer: a

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			✓	
Was a MS/MSD analyzed every 20 samples of each matrix?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 126283G
SDG #: K240629

VALIDATION FINDINGS WORKSHEET

Reviewer: JP
2nd Reviewer: K

METHOD: Pesticide/PCBs (EPASW 846 Method 8081)

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

Notes:

LDC #: 12662A36
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: EJ
2nd Reviewer: [illegible]

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

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1-5	cooler	temp =	11°C				J/UJ/A

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

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

HTNew.wpd

LDC #: 12662436
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: F
2nd Reviewer: QR

METHOD: GC ✓ HPLC ____

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

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (100 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	CAL 3870 GC09 DB35MS	10/1/04	1260-1	154	154	141	141	16.5	16.5
2	DB-XLB	10/1/04	1260-1	191	191	200	200	16.1	16.1
3									
4									

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

LDC #: 12662A3b
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: [illegible]
2nd Reviewer: K

METHOD: GC ____ HPLC ____

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

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	1005F003	10/5/04	1260-1	159	152	152	5	5
	DB-35MS							
2	DB-XLB	10/5/04	1260-1	200	186	186	7	7
3	1012F017	10/13/04	↓	159	136	136	14	14
	DB35MS							
4	DB-XLB	↓	↓	200	178	178	11	11

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

LDC #: 12662A3b
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl				~~30-150~~		
Decachlorobiphenyl	DB-XLB	100	64.37	64	64	0

Sample ID:

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

Sample ID:

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

Sample ID:

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

Notes:

C:\WPDOCS\WRK\PEST\SURRCALC.3S

LDC #: 12662A36
SDG #: K2406232

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

Reviewer: BJ
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

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

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

Where SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: KWG0414868-1/2

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	---	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Aroclor 1260	200	200	0	161	162	81	81	81	81	0	0

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

LDC #: 12662A36
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: KB
2nd reviewer: VL

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

1254-1 = ~~5569~~ / ~~185.584~~

= 7401 / 210.185 = 35.21

35.21 × 4 / 2.0 = 69.72

Example:

Sample I.D. #2 1254:

Conc. = ((69.72 + 40 + 90 + 68 + 64) / 5)

= 66 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Note:

LDC #: 12662B3b

SDG #: K2406297

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 10/27/04

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18 → 8/19/04
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	~~none/pr~~ insufficient sample
VIII.	Laboratory control samples	A	LCS ID
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	N	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

TISSUE

1	LDW ~~LWD~~-B6b-T	11	KWG0414868-3	21		31	
2	LDW ~~LWD~~ B8b-T	12		22		32	
3	LDW ~~LDW~~-B10b-T	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12662C3b

SDG #: K2406517

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 10/27/04

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 → 8/27/04
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	A/A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	N	
XIV.	Field duplicates	~~SW~~ N	D=2,3, ~~5,6,7,8,10,11~~
XV.	Field blanks	N	

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

Validated Samples:

TISSUE (clam)

1	LDW-C8-T	11	LDW-C3-T1	21	KWG0413714-6	31	
2	LDW-C7-T2	12	LDW-C9-T	22		32	
3	LDW-C7-T1	13	LDW-C6-T	23		33	
4	LDW-C1-T	14	LDW-C4-T	24		34	
5	LDW-C2-T1	15	LDW-C2-T2MS	25		35	
6	LDW-C2-T2	16	LDW-C2-T2MSD	26		36	
7	LDW-C10-T2	17	LDW-C2-T2DUP	27		37	
8	LDW-C10-T1	18		28		38	
9	LDW-C5-T	19		29		39	
10	LDW-C3-T2	20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

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

Notes:_____

LDC #: 12662c36
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 6 of 7
Reviewer:
2nd Reviewer:

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

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

#	Compound Name	% RPD between columns ≤ 40 Finding	Associated Samples	Qualifications
	Z	83.1	1	J/A det
	Z	91	2	
	Z	86	3	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662D3b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/28/04
SDG #: K2406581 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: FF
2nd Reviewer: SC

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	~~MS~~ /Fn insufficient sample
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	N	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples:

TISSUE

1 +	LDW-B7a-T	11	KWG0414868-3	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12662E3b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/05
SDG #: K2406932 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17 to 8/30/04
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	~~not~~ insufficient sample
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	N	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples:

1	LDW-B8a-T	11	KW G0414868-3	21		31	
2	LDW-B10a-T	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12662F3b
SDG #: K2407216
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 10/27/04
Page: of
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26 – 8/27/04
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	~~none~~ insufficient sample
VIII.	Laboratory control samples	A	LCS/1
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	N	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples:

Tissue

1 +	LDW-B3a-T	11	KWG0414868-3	21		31	
2 +	LDW-B9a-T	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12734A3b

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/15/04

SDG #: K2407452

Page: 1 of 1

Laboratory: Columbia Analytical Services

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DUP	N/A	LDW-B5b-T DUP NO MS/MSD insufficient sample
VIII.	Laboratory control samples	A	LCS ID
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples:

tissue

1	LDW-B5a-T	11		21		31	
2	KWG0416042-5	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12734D3b
SDG #: K2407596
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/1
Page: 1 of 1
Reviewer: P
2nd Reviewer: X

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27 - 9/28/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	N A	No MS/MSD insufficient sample
VIII.	Laboratory control samples	A	LCS ID
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ~~sediment~~ tissue

1†	LDW-B4b-T	11	KWG0416042-5	21		31	
2†	LDW-B5b-T	12		22		32	
3†	LDW-B1b-T	13		23		33	
4†	LDW-B2b-T	14		24		34	
5	LDW-B5b-TDUP	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12662A4

SDG #: K2406232

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II/

Date: 11/4/04

Page: 1 of 1

Reviewer: MM

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/10 - 15/04
II.	Calibration	~~SW~~ N	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	N	3 No MS/Dup Test ~~NONE/P~~ insufficient sample
VI.	Duplicate Sample Analysis	N	~~NONE/P~~
VII.	Laboratory Control Samples (LCS)	SW	LCS/LCSD (No SRM) Test
VIII.	Internal Standard (ICP-MS)	A	
IX.	Furnace Atomic Absorption QC	A	Test was not ~~performed~~ by required (hydride)
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	A ~~N~~	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Tissue

1	LDW-B1a-T	11		21		31	
2	LDW-B4a-T	12		22		32	
3	LDW-B2a-T	13		23		33	
4	LDW-B9b-T	14		24		34	
5	LDW-B6a-T	15		25		35	
6	LDW-B3b-T	16		26		36	
7	LDW-B7b-T	17		27		37	
8	PB	18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 126284
SDG #: K24062J2

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: MB
2nd Reviewer:

Method: Metals (EPA SW 846 Method 6010/7000/6020) 4

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Was a midrange cyanide standard distilled?			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
IV. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.			✓	
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?		✓		
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients ≥ 0.995?			✓	
Do all applicable analysies have duplicate injections?	✓			

LDC #: 12662A4
SDG #: K160632

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: MV
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%?	✓			
Were analytical spike recoveries within the 85-115% QC limits?			✓	Hybrid
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			
Were all percent differences (%Ds) ≤ 10%?		✓		
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		✓		
VIII. Internal Standards (EPA SW 846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.		✓	✓	
Target analytes were detected in the field blanks.			✓	

LDC #: 12662A4
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-7	Tissue	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], ~~Fe~~, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, [✓ Se], Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12662A4
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) 6020

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

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Y N N/A Was a midrange cyanide standard distilled?

Y N N/A Are all correlation coefficients ≥0.995?

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data
1	10/8/04	CRDL	V	57 (70-130)	All	No qual (All > 2xCRDL)

Comments:

CAL_4SW

LDC #: 12662/54
SDG #: K24C632

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: MV
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: 10 X
Sample Concentration units, unless otherwise noted: _____ Associated Samples: ~~All~~ 1-6, except Co #2 = 7

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification										
Al															Al
Sb					No samples qualified.										Sb
As															As
Ba					(All > CRDL + 5x blank conc.)										Ba
Be															Be
Cd															Cd
Ca															Ca
Cr															Cr
Co #1			0.0187												Co
Co #2			0.0347												Cu
Fe															Fe
Pb															Pb
Mg															Mg
Mn															Mn
Hg															Hg
Ni			0.178												Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn															Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

LDC #: 12662A4
SDG #: K24062

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) / 6020

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

(Y) N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all aqueous LCS percent recoveries (%R) within the control limits of ~~80-120%~~ 60-130 and all soil LCS %R within laboratory established control limits. RPD ≤ 30%.

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte	%R (limits) LCS	%R (limits) LCSD	RPD	Associated Samples	Qualifications
1	LCS/LCSD	Tissue	Ag	49		48	All	J / R / P

Comments:

LCS.4S2

LDC #: 12662A4
SDG #: K24062362

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B5b-T	Tissue	Cd	15	All	J/UJ/A
	(SDG K2406362)		Co	15	↓	↓
			Cu	17		
			Ag	~~X~~ 15	↓	↓

Comments:

SDIL.4S2

LDC #: 12662B4
SDG #: K4A6R32

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020

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

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP (Initial calibration)	Cr	507.2	500	101	101	Y
↓	GFAA (Initial calibration)	Se	10.15	10	102	102	↓
↓	CVAA (Initial calibration)	Hg	4.98	5.0	100	100	↓
CCV	ICP (Continuing calibration)	Zn	485.5	500	97	97	↓
↓	GFAA (Continuing calibration)	Se	9.78	10	98	98	↓
↓	CVAA (Continuing calibration)	Hg	5.08	5.0	102	102	↓
ICV	~~Cyanide~~ (Initial calibration) ICP/MS	Tl	25.85	25	103	103	↓
CCV	~~Cyanide~~ (Continuing calibation) ICP/MS	Sb	24.46	25	98	98	↓

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

CALCLC.4SW

LDC #: 17662A4
SDG #: K4062

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MM
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020

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

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

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

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

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

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
TCSAB	ICP interferance check	V	468.5	500	94	94	Y
LCS	Laboratory control sample	Pb	482.5	500	97	96	Y
MS	Matrix spike		(SSR-SR)				
↓	Duplicate						
L1W1351-I	ICP serial diluton	As	23.12	21.97	5	5	Y

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

TOTCLC.4SW

LDC #: 12662B4
SDG #: K240232

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MV
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)/6020

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

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

Detected analyte results for 1 were recalculated and verified using the following equation:

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

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

$Cu = \frac{104.3\ ug/L \times 0.02\ L \times 5}{2.38\ g} = 4.38\ ug/g$

Sample ID	Analyte	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Acceptable (Y/N)
1	Sb	0.0074	0.0074	Y
	As	0.623	0.623	
	Cd	0.0269	0.0269	
	Cr	0.08	0.08	
	Co	0.0514	0.0514	
	Cu	4.38	4.38	
	Pb	0.5060	0.5067	
	Hg	0.016	0.016	
	Mo	0.0563	0.0563	
	Ni	0.094	0.094	
	Se	0.085	0.085	
	Ag	0.0129	0.0129	
	Tl	0.0006	0.0006	
	V	0.26	0.26	
	Zn	8.22	8.22	

RECALC.4S2

LDC #: 12662B4

SDG #: K2406297

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/4/-4

Page: 1 of 1

Reviewer: hy

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18, 19/04
II.	Calibration	N	
III.	Blanks	A	PB
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	N	} no MS/Dup. Test insufficient sample
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS/LCSD, No SRM, Test.
VIII.	Internal Standard (ICP-MS)	N	Not reviewed.
IX.	Furnace Atomic Absorption QC	A	MSA was not ~~performed~~ required (Hydride)
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples:

1	DW Tissue LWD-B6b-T	11		21		31	
2	DW LWD-B8b-T	12		22		32	
3	LDW-B10b-T	13		23		33	
4	PB	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12662B4
SDG #: K2406297

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: A

All circled elements are applicable to each sample.

Sample ID	Matrix	µg Target Analyte List (TAL)
1-3	Tissue	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, [✓ Se], Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12662B4
SDG #: K2406297

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B8a-T	Tissue	Co	15	A11	J/UJ/A
			Cu	12	↓	↓
			Ni	22		
			Ag	11		

Comments:

SDIL.4S2

LDC #: 12662C4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/14/04
SDG #: K2406517 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MM
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/23-24/04
II.	Calibration	N	
III.	Blanks	A	PB.
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	A	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	SW	~~LCS~~ laucs SRM.
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	A	MSA was not required (hydride)
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	~~N~~ SW	~~(2,3), (5,6), (7,8), (10,11)~~ R
XIV.	Field Blanks	N	

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

Validated Samples: Tissue

1	LDW-C8-T	11	LDW-C3-T1	21		31	
2	LDW-C7-T2	12	LDW-C9-T	22		32	
3	LDW-C7-T1	13	LDW-C6-T	23		33	
4	LDW-C1-T	14	LDW-C4-T	24		34	
5	LDW-C2-T1	15	LDW-C2-T2MS	25		35	
6	LDW-C2-T2	16	LDW-C2-T2DUP	26		36	
7	LDW-C10-T2	17	PB	27		37	
8	LDW-C10-T1	18		28		38	
9	LDW-C5-T	19		29		39	
10	LDW-C3-T2	20		30		40	

Notes:

LDC #: 12662C4
SDG #: K2406514

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-14	Tissue	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], ~~Fe~~, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN⁻, ___ ___
m15,16	↓	Al, ~~Sb, As~~, Ba, Be, [✓ Cd], Ca, ~~Cr, Co, Cu~~, Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, ~~Tl~~, [✓ V, Zn, Mo], B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, [✓ Se], Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻,

Comments: ¹Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12662C4
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) 6020

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

Y (N) N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

(Y) N N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	No SRM	Tissue	Sb, Mo, Tl, V.		All	Text.

Comments:

LDC #: 12662c4
SDG #: K240617

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	6	Tissue	As	11	All	J/UJ/A

Comments:

SDIL.4S2

LDC #: 12662D4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/4/04
SDG #: K2406581 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MM
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	N	3 NO MS/Dup. ~~Lab Duplicate~~ NONE/D Sample
VI.	Duplicate Sample Analysis	N	"
VII.	Laboratory Control Samples (LCS)	SW	LCS/LCSD. No SRM, Test.
VIII.	Internal Standard (ICP-MS)	N	N.t ~~required~~ reviewed
IX.	Furnace Atomic Absorption QC	A	MSA was not required. (Hydride)
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples: Tissue

1	LDW-B7a-T	11		21		31	
2	FB	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: rep # SD summary from SDG K2406297

LDC #: 12662D4
SDG #: K2406581

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	Tissue	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], ~~Fe~~, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, [✓ Se], Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻,

Comments: ¹Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12662D4
SDG #: K240658 1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) 6020

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

(Y) N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all aqueous LCS percent recoveries (%R) within the control limits of ~~80-120%~~ 60-130 and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte		%R (limits)	RPD	Associated Samples	Qualifications
1	LCS/LCSD	Tissue	Ag	49		48(≤30)	A1	J/R/P

Comments:

LDC #: 12662D4
SDG #: K240688

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020)

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B5b-T	Tissue	Cd	15	All	J/UJ/A
			Co	15	↓	↓
			Cu	17		
			Ag	15	↓	↓

Comments:

LDC #: 12662E4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/4/04
SDG #: K2406932 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MM
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17, 9/5/04
II.	Calibration	N	
III.	Blanks	A	PB
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	N	3 NO MS/Dup ~~insufficient sample~~ ~~NONE/R~~ "
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A ~~SW~~	LCS/LCSD, ~~Dup~~ No SRM. ~~Test~~.
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	A	~~Not Required~~: MSA not required (hydride)
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples:

Tissue

1	LDW-B8a-T	11		21		31	
2	LDW-B10a-T	12		22		32	
3	PB	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12662E4
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	wy Target Analyte List (TAL)
1, 2	Tissue	Al, [✓ Sb, As] Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], ~~Fe~~, [✓ Pb] Mg, Mn, [✓ Hg] [✓ Ni] K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As] Ba, Be, [✓ Cd], Ca, Cr, [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni] K, Se, [✓ Ag] Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, [✓ Se], Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: [✓ Mercury by CVAA if performed]

ELEMENTS.4

LDC #: 12662 B4
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	1	Tissue	Co	15	All	J/nJ/A
			Cu	12	↓	↓
			Ni	22		
			Ag	11		

Comments:

SDIL.4S2

LDC #: 12662F4
SDG #: K2407216
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/4/04
Page: 1 of 1
Reviewer: MH
2nd Reviewer: A

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26, 27/04
II.	Calibration	N	
III.	Blanks	A	PB
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	N	No MS/Dup. ~~Test~~ insufficient sample / ~~None~~ "
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	Les/LCSD. No SRM. Test.
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	A	MSA was not required (Hydride)
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples: Tissue

1	LDW-B3a-T	11		21		31	
2	LDW-B9a-T	12		22		32	
3	PB	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12662F4
SDG #: K2409216

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Mn Target Analyte List (TAL)
1, 2	Tissue	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], ~~Fe~~, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, [✓ Se], Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___

Comments: ¹Mercury by CVAA if performed

LDC #: 12662#4
SDG #: ~~K1406272~~ K1406 9/16

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: MH
2nd Reviewer:

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

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

(Y) N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all aqueous LCS percent recoveries (%R) within the control limits of ~~80-120%~~ 60-130 and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte	LCS	LCSD %R (limits)	RPD	Associated Samples	Qualifications
1	LCS/LCSD	Tissue	Ag	49		48 (≤30)	All	J/R/P

Comments:

LCS.4S2

LDC #: 16627F4
SDG #: Krf0 72/6

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

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

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

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-BSb-T	Tissue	cd	15	All	J/nJ/A
	(SDG Krf062)		co	15	↓	↓
			Cu	17		
			Ag	15		

Comments:

SDIL.4S2

LDC #: 12734A4

SDG #: K2407452

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/10/04

Page: 1 of 1

Reviewer: HY

2nd Reviewer: [signature]

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	N	3 Insufficient sample for MS/Dup.
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS/LCSD for ICP/MS, ICP. SRM for Hg. (No SRM for ICP/MS, ~~Hg~~ metals)
VIII.	Internal Standard (ICP-MS)	N	Not reviewed.
IX.	Furnace Atomic Absorption QC	A	Hydride, MSA was not required
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples:

Tissue

1	LDW-B5a-T	11		21		31	
2	[illegible]	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: LCS/LCSD Summary missing in data package. Form SR4 K2407452-5.tx

LDC #: 12034A4
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	Tissue	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], Co, [✓ Cu], Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, [✓ Co], Cu, Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, [✓ Tl], ~~V~~, ~~Zn~~, [✓ Mo], B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, [✓ Se], Ag, Na, Tl, ~~V~~, Zn, Mo, B, Si, CN⁻,

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 123484
SDG #: K240752

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer:

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

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B4D-T	Tissue	Cd	23	(1)	J/UJ/A
	(SDG K240752)		Ni	11	↓	↓

Comments:

LDC #: 12734D4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/10/04
SDG #: K2407596 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MM
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27, 28/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	N	3 Insufficient sample for MS/Dup
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS/lcsd for ICP/MS, ICP, metals SRM for Hg. (No SRM for ICP/MS, ICP metals
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	A	hydride, MSA were not required
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples:
Tissue

1	LDW-B4b-T	11		21		31	
2	LDW-B5b-T	12		22		32	
3	LDW-B1b-T	13		23		33	
4	LDW-B2b-T	14		24		34	
5	FB	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12734D4
SDG #: K2409596

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: ______

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-4	Tissue	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___

Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], Co, [✓ Cu], Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, [✓ Co], Cu, Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, Se, [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, [✓ Se], Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12734D4
SDG #: K1407596

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer:

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

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	1	Tissue	Cd	23	All	J/UJ/A
			Ni	11	↓	↓

Comments:

LDC #: 12736A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 4/1-1-4
SDG #: K2407455 Level II / IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MJ
2nd Reviewer: JK

METHOD: Arsenic (EPA SW 846 Method ~~6010B~~ 6020)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/23/04
II.	Calibration	A M	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	A	
IX.	Furnace Atomic Absorption QC	N	No Analysis
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples: Tissue #4 level 4.

1	BI-C-T1	11	SP-C-T5	21		31	
2	BI-C-T2 **	12	SP-C-T6	22		32	
3	BI-C-T3 **	13	BI-C-T3MS	23		33	
4	BI-C-T4	14	BI-C-T3DUP	24		34	
5	BI-C-T5	15	DB	25		35	
6	BI-C-T6	16		26		36	
7	SP-C-T1	17		27		37	
8	SP-C-T2	18		28		38	
9	SP-C-T3	19		29		39	
10	SP-C-T4	20		30		40	

Notes: _____

LDC #: 12736154
SDG #: K2407457

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: MB
2nd Reviewer: [illegible]

4

Method: Metals (EPA SW 846 Method 6010/7000/6020)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Was a midrange cyanide standard distilled?			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
IV. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients ≥ 0.995?			✓	
Do all applicable analysies have duplicate injections?			✓	

LDC #: 27368A
SDG #: K2407455

VALIDATION FINDINGS CHECKLIST

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

Validation Area	Yes	No	NA	Findings/Comments
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%?			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			
Were all percent differences (%Ds) ≤ 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
VIII. Internal Standards (EPA SW 846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 12736B4
SDG #: K24-9485

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MV
2nd Reviewer:

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

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

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP (Initial calibration)	Hg	25.69	25.0	103	103	Y
	GFAA (Initial calibration)						
	CVAA (Initial calibration)						
CCV	ICP (Continuing calibration)	Hg	23.52	25.0	94	94	
	GFAA (Continuing calibration)						
	CVAA (Continuing calibration)						
	Cyanide (Initial calibration)						
	Cyanide (Continuing calibation)						

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

LDC #: 12736A4
SDG #: K240745

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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

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

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

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

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

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

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Ag	21.97	20	110	110	Y
LCS	Laboratory control sample		19.85 ~~18.6~~	18.0	110	110	
13	Matrix spike		(SSR-SR) 22.1	28.4	78	78	
14	Duplicate		1.695	1.681	0.5	1	
3	ICP serial dilution		18.58	19.68	6	6	

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

T0TCLC.4SW

LDC #: 12736A4
SDG #: K1407455

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MV
2nd reviewer: A

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

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

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

Detected analyte results for 3 were recalculated and verified using the following equation:

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

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

$$As = \frac{19.68\ ug/L \times 5 \times 0.03\ L}{1.75\ g} = 1.687\ ug/g$$

Sample ID	Analyte	Reported Concentration (ug/ug)	Calculated Concentration (ug/ug)	Acceptable (Y/N)
3	As	1.680	1.687	Y

RECALC.4S2

LDC #: 12691G4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/10/04
SDG #: 04BR710 Level II / IV Page: 1 of 1
Laboratory: BrooksRand Trace Metals Analysis & Products Reviewer: MH
2nd Reviewer: A
METHOD: Inorganic Arsenic (EPA Method 1632) M

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 - 27/04
II.	Calibration	~~D. N~~	
III.	Blanks	~~Lumped~~ A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	N.t Required
V.	Matrix Spike Analysis	A	MS done
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	N	~~D/S~~ SRM was not certified for Inorganic As.
VIII.	Internal Standard (ICP-MS)	N	N.t Utilized
IX.	Furnace Atomic Absorption QC	A	hydride.
X.	ICP Serial Dilution	N	N.t Required
XI.	Sample Result Verification	A ~~N~~	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples: ~~14~~ level 4

1	LDW-C7-T2	11	~~LDW-C2-T1DUP~~	21		31	
2	LDW-C1-T ~~14~~	12		22		32	
3	LDW-C2-T1 ~~14~~	13		23		33	
4	LDW-C5-T	14		24		34	
5	LDW-C3-T1	15		25		35	
6	LDW-C9-T	16		26		36	
7	LDW-C6-T	17		27		37	
8	LDW-C4-T	18		28		38	
9	LDW-C2-T1MS	19		29		39	
10	LDW-C2-T1MSD	20		30		40	

Notes: _____

LDC #: 12619 4
SDG #: 04BR710

VALIDATION FINDINGS CHECKLIST

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

4 1632M

Method: Metals (EPA ~~SW 846 Method 6010/7000/6020~~)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Was a midrange cyanide standard distilled?			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓	✓		
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✗	✓		
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?			✓	
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?			✓	
IV. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients ≥ 0.995?			✓	
Do all applicable analysies have duplicate injections?				

LDC #: 12691G4
SDG #: 048R710

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: MV
2nd Reviewer: N

Validation Area	Yes	No	NA	Findings/Comments
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%?				
Were analytical spike recoveries within the 85-115% QC limits?				
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?			✓	
Were all percent differences (%Ds) ≤ 10%?			✓	
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
VIII. Internal Standards (EPA SW 846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?			✓	
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 26916G4
SDG #: 04BR71

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MV
2nd Reviewer:

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

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

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV	GFAA (Initial calibration)	As	5.27	5.0	104.4	104.4	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV	GFAA (Continuing calibration)	As	5.12	5.0	102.4	102.3	Y
	CVAA (Continuing calibration)						
	Cyanide (Initial calibration)						
	Cyanide (Continuing calibation)						

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

CALCLC.4SW

LDC #: 126164
SDG #: 04BK7L0

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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

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

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

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

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

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

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
LCD	ICP interference check						
LCS	Laboratory control sample						
9	Matrix spike	Ag	(SSR-SR) 166.7	192	86.8	86.9	Y
9D	Duplicate	Ag	183	167	9.1	8.3	Y
SDA	ICP serial dilution						

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

T0TCLC.4SW

LDC #: 12691G4
SDG #: 04BR710

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MH
2nd reviewer:

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

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

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

Detected analyte results for 3 were recalculated and verified using the following equation:

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

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

$As = \frac{3.61\ ng \times 0.0\ l \times 10^{-3}\ mg/ng}{0.366g \times 0.131\% \times 0.001\ l} = 4.916\ mg/g$ MH

Sample ID	Analyte	Reported Concentration (ug/g)	Calculated Concentration (ug/g)	Acceptable (Y/N)
3	As (Inorganic)	4.913	4.916	Y

RECALC.4S2

LDC #: 12747A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/10/04

SDG #: 04BR739 Level II Page: 1 of 1

Laboratory: Brooks Rand LLC Reviewer: MM

Inorganic 2nd Reviewer:

METHOD: Arsenic (EPA Method 1632)M

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/23/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not required
V.	Matrix Spike Analysis	SW	MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	N	Not utilized
IX.	Furnace Atomic Absorption QC	A	hydride
X.	ICP Serial Dilution	N	Not required
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

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

Validated Samples: Tissue

1	B1-C-T1	11	SP-C-T5	21		31	
2	B1-C-T2	12	SP-C-T6	22		32	
3	B1-C-T3	13	B1-C-T4MS	23		33	
4	B1-C-T4	14	B1-C-T4MSD	24		34	
5	B1-C-T5	15	SP-C-T4MS	25		35	
6	B1-C-T6	16	SP-C-T4MSD	26		36	
7	SP-C-T1	17	FB	27		37	
8	SP-C-T2	18		28		38	
9	SP-C-T3	19		29		39	
10	SP-C-T4	20		30		40	

Notes: _____

LDC #: 12747A4
SDG #: 04BR33

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MD
2nd Reviewer:

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

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

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	13/14	Tissue	Inorganic As	132.4	131.3		A1	J+ Lt /A
2	15/16	Tissue	↓		135.5		A1	J+ Lt /A

Comments:

MSD.4S2

LDC #: 12662A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/4/04
SDG #: K2406232 Level IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MM
2nd Reviewer: L

METHOD: Total % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/10 – 15/04
IIa.	Initial calibration	~~N~~	
IIb.	Calibration verification	~~N~~	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	N.t requires
V	Duplicates	N	No Dup. Test ~~not~~ insufficient sample
VI.	Laboratory control samples	N	~~LCS/LCSD~~ DM. N.t required
VII.	Sample result verification	~~N~~	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Tissue

1	LDW-B1a-T	11		21		31	
2	LDW-B4a-T	12		22		32	
3	LDW-B2a-T	13		23		33	
4	LDW-B9b-T	14		24		34	
5	LDW-B6a-T	15		25		35	
6	LDW-B3b-T	16		26		36	
7	LDW-B7b-T	17		27		37	
8	MB	18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12662A6
SDG #: K2406232

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MH
2nd Reviewer:

Method: Inorganics (EPA Method N08A)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?				
Were the proper number of standards used?			✓	
Were all initial calibration correlation coefficients ≥ 0.995?			✓	
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?			✓	
Were titrant checks performed as required?			✓	
Were balance checks performed as required?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.			✓	
V. Laboratory control samples				
Was an LCS analyzed for this SDG?		✓		
Was an LCS analyzed per extraction batch?			✓	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?			✓	
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

LDC #: 12667B6
SDG #: K2406V3

VALIDATION FINDINGS CHECKLIST

Reviewer: MR
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 1266-A6
SDG #: Kit0623

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MH
2nd reviewer: A

METHOD: Inorganics, Method NOAA

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

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

Compound (analyte) results for _____ reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

$$\% \text{ Lipid} = \frac{[(\text{Wt. Light Lipid} - \text{Wt. Dish}) - \text{Blank}] \times 5 \times 100}{\text{Sample wt}}$$

$$\% \text{ Lipid} = \frac{(1.2543 - 1.2304)\text{ g} \times 5}{2.02\text{ g}} \times 100$$

$$= 0.965\ \%$$

#	Sample ID	Analyte	Reported Concentration (%)	Calculated Concentration (%)	Acceptable (Y/N)
1	1	% Lipids	0.97	0.97	Y

Note: _____

LDC #: 12662B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/9/05
SDG #: K2406297 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MH
2nd Reviewer:

METHOD: Total % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18, 19/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	N.t required
V	Duplicates	N	No Dup, ~~Test~~ insufficient sample ~~Native~~
VI.	Laboratory control samples	N	N.t required
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

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

Validated Samples: Tissue

1	LWD-B6b-T	11		21		31	
2	LWD-B8b-T	12		22		32	
3	LDW-B10b-T	13		23		33	
4	MB	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12662C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/4/04
SDG #: K2406517 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: KM
2nd Reviewer:

METHOD: % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25-29/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	Not required
V	Duplicates	A	~~MS~~ Triplicate.
VI.	Laboratory control samples	N	Not required
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N SW	~~(1,3), (5,6), (7,8), (10,11)~~ KL
X	Field blanks	N	

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

Validated Samples: Tissue

1	LDW-C8-T	11	LDW-C3-T1	21		31	
2	LDW-C7-T2	12	LDW-C9-T	22		32	
3	LDW-C7-T1	13	LDW-C6-T	23		33	
4	LDW-C1-T	14	LDW-C4-T	24		34	
5	LDW-C2-T1	15	LDW-C2-T2DUP	25		35	
6	LDW-C2-T2	16	LDW-C2-T2TRP	26		36	
7	LDW-C10-T2	17	MS	27		37	
8	LDW-C10-T1	18		28		38	
9	LDW-C5-T	19		29		39	
10	LDW-C3-T2	20		30		40	

Notes:

LDC #: 12662D6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/4/04
SDG #: K2406581 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MY
2nd Reviewer:

METHOD: % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	N.t required
V	Duplicates	N	No dup, ~~Test~~ ~~Investigation~~ ~~NOAA~~ Sample
VI.	Laboratory control samples	N	N.t required
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

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

Validated Samples: Tissue

1	LDW-B7a-T	11		21		31	
2	MB	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12662E6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/4/04
SDG #: K2406932 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MM
2nd Reviewer: A

METHOD: % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/19, 9/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	Not required
V	Duplicates	N	No dup. Insufficient sample for ~~Lipid~~ NONE/P
VI.	Laboratory control samples	N	Not required.
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

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

Validated Samples: Tissue

1	LDW-B8a-T	11		21		31	
2	LDW-B10a-T	12		22		32	
3	MB	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12662F6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/4/04
SDG #: K2407216 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MH
2nd Reviewer:

METHOD: % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: ~~8/26,~~ 8/26, 27/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	N.t required
V	Duplicates	N	No Dup. ~~Test~~ insufficient sample ~~NOT~~
VI.	Laboratory control samples	N	N.t required.
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

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

Validated Samples: Tissue

1	LDW-B3a-T	11		21		31	
2	LDW-B9a-T	12		22		32	
3	MB	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12734A6
SDG #: K2407452
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: km
2nd Reviewer: [illegible]

METHOD: % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	MB
IV	Matrix Spike/Matrix Spike Duplicates	N	Not required
V	Duplicates	A	Dup from SDG K2407596
VI.	Laboratory control samples	N	Not required
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Tissue

1	LDW-B5a-T	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12734D6

SDG #: K2407596

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/10/04

Page: 1 of 1

Reviewer: MM

2nd Reviewer:

METHOD: % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27, 28/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	Not required
V	Duplicates	A	
VI.	Laboratory control samples	N	Not required
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Tissue

1	LDW-B4b-T	11		21		31	
2	LDW-B5b-T	12		22		32	
3	LDW-B1b-T	13		23		33	
4	LDW-B2b-T	14		24		34	
5	LDW-B5b-TDUP	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12736A6

SDG #: K2407455

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/10/04

Page: 1 of 1

Reviewer: m

2nd Reviewer: K

METHOD: Total % Lipids (Method NOAA)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/23/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	N	Not required
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	N	Not required
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Tissue

1	BI-C-T1	11	SP-C-T5	21		31	
2	BI-C-T2	12	SP-C-T6	22		32	
3	BI-C-T3	13	BI-C-T1DUP	23		33	
4	BI-C-T4	14	BI-C-T1TRP	24		34	
5	BI-C-T5	15	MB	25		35	
6	BI-C-T6	16		26		36	
7	SP-C-T1	17		27		37	
8	SP-C-T2	18		28		38	
9	SP-C-T3	19		29		39	
10	SP-C-T4	20		30		40	

Notes:

LDC #: 12662A19
SDG #: K2406232
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 10/28/04
Page: 1 of 1
Reviewer: KT
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/10 - 8/15/04
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	ICV ≤ 25, CCV ≤ 25
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	None/R insufficient sample
IVc.	Laboratory control samples /SRM	A/A	LCS/D
V.	Target compound identification	A	
VI.	Compound Quantitation and CRQLs	A	
VII.	System Performance	A	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

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

Validated Samples:

Tissue

1	LDW-B1a-T	11	KW90149-14-3	21		31	
2	LDW-B4a-T	12		22		32	
3	LDW-B2a-T	13		23		33	
4	LDW-B9b-T	14		24		34	
5	LDW-B6a-T	15		25		35	
6	LDW-B3b-T	16		26		36	
7	LDW-B7b-T	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12662A19
SDG #: K2406232

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: ____ GC ____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.		✓		
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ ~~15%~~ 25.0 or percent recoveries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.			✓	
Was a MS/MSD analyzed every 20 samples of each matrix?			✓	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 12662A19
SDG #: K2406232

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds idetected in the field duplicates?			✓	
XV. Field blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	

LDC #: 12662A19
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: KM
2nd Reviewer: LR

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

METHOD: ~~GC~~ HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1-5	Tissue	cooler temp = 11°C					~~J/UJ/A~~

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

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

HTNew.wpd

LDC #: 12662A19
SDG #: K2406232

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

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

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ SRM amount w/ acceptable limits

Level IV/D Only

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

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	NO SRM was analyzed for (Tetra-n-Butyltin					All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			SRM = standard (reference (material				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12662A19
SDG #: 1K24062 32

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: PT
2nd Reviewer: DC

METHOD: GC ✓ HPLC ____

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

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (50 std)	Recalculated CF (523 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	CAL3856 RTX-1 GC26	9/24/04	Tetra-n-butyltin	84100	84100	82000	82000	5.7	5.7
2	RTX-35		↓	54800	54800	56200	56200	6.7	6.7
3									
4									

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

LDC #: 12662A19
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: CC

METHOD: GC ✓ HPLC ____

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

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	~~CA 3856~~ RTX 1	9/24/04	~~Tri-n-propyltin~~					
2	1005F021 RTX-1	10/5/04	Tetra-n-butyltin	82000	65200	65200	21	21
3	1005F021 RTX-35	10/5/4	Tetra-n-butyltin	56200	58400	58400	4	4
4								

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

LDC #: 12662A19
SDG #: K240623 2

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: ~~GC~~ ___ HPLC

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tri-n-propyltin	RTX-35	500	289.63	58	58	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 12662A19
SDG #: K2406232

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

Reviewer: EF
2nd Reviewer: K

METHOD: ~~GC~~ HPLC

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

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

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory Control Sample
SC = Sample concentration
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: KWG0412914-1/2

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	---	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Tetra-n-butyltin	222	222	0	122	120	55	55	54	54	2	2

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

LDC #: 26624A19
SDG #: K2406232

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #2 Compound Name _____

Concentration = $\frac{5094558 \quad 1.0\,ml}{82900 \quad 2.03\,g}$

= 30 ug/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

LDC #: 12662B19 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/04
SDG #: K2406297 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18 - 8/19/04
IIa	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	not if insufficient sample
IVc.	Laboratory control samples /SRM	A/A	LCS ID
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

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

Validated Samples: Tissue

1	LDW ~~LWD-B6b-T~~	11	KW60414914-3	21		31	
2	LDW ~~LWD-B8b-T~~	12		22		32	
3	LDW ~~LDW~~-B10b-T	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12662B19
SDG #: K2406297

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS~~ percent recoveries (%R) and ~~relative percent differences (RPD)~~ within the QC limits?
SRM amount w/ acceptable limits

Level IV/D Only

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

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	NO SRM was analyzed for (Tetra-n-Butyltin		( )	( )	( )	All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	SRM = standard (reference (material		( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12662C19 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/04
SDG #: K2406517 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: FT
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 - 8/26/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates /DUP	SW/A	
IVc.	Laboratory control samples /SRM	A/A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	SW	
VII.	System Performance	N	
VIII.	Overall assessment of data	SW	
IX.	Field duplicates	~~SW~~ N	~~D= 3+5, 4+6 9+11 10+12~~ [illegible]
X.	Field blanks	N	13+15 14+16 19+21 20+22

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

Validated Samples:

1	LDW-C8-T	11	LDW-C2-T2	21	LDW-C3-T1	31	LDW-C2-T2DUP
2	LDW-C8-TDL	12	LDW-C2-T2DL	22	LDW-C3-T1DL	32	
3	LDW-C7-T2	13	LDW-C10-T2	23	LDW-C9-T	33	
4	LDW-C7-T2DL	14	LDW-C10-T2DL	24	LDW-C9-TDL	34	
5	LDW-C7-T1	15	LDW-C10-T1	25	LDW-C6-T	35	
6	LDW-C7-T1DL	16	LDW-C10-T1DL	26	LDW-C6-TDL	36	
7	LDW-C1-T	17	LDW-C5-T	27	LDW-C4-T	37	
8	LDW-C1-TDL	18	LDW-C5-TDL	28	LDW-C4-TDL	38	
9	LDW-C2-T1	19	LDW-C3-T2	29	LDW-C2-T2MS	39	
10	LDW-C2-T1DL	20	LDW-C3-T2DL	30	LDW-C2-T2MSD	40	

Notes: samples extracted 10 gram
MDL = QAPP

12662C19W.wpd

326

LDC #: 12662 B19
SDG #: K2406297

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS~~ percent recoveries (%R) and relative percent differences (RPD) within the QC limits?
SRM amount w/ acceptable limits

Level IV/D Only

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

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	No SRM was analyzed for (Tetra-n-Butyltin					All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			SRM = standard (reference (material				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 1262019
SDG #: K2406577

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

METHOD: ✓ GC ___ HPLC

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

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	29 + 30	Tri-n-butyltin	-28 (20-130)	-48 (20-130)	( )	11	no QUAL
			( )	( )	( )		parent 72x
			( )	( )	( )		spike Amt
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 12662c19
SDG #: K246517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

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

#	Compound Name	Finding (% RPD Between 2 column ≤ 40)	Associated Samples	Qualifications
	Di-n-butyltin	61	1	J/A det
	↓	93	23	J/A det
	↓	200%	#2	J/A det

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662c19
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: KS
2nd Reviewer: SC

METHOD: ~~GC~~ HPLC

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

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

#	Compound Name	Finding	Associated Samples	Qualifications
	Tri-n-butyltin	Exceeded cal range	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27	Jdetect /A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662c19
SDG #: K2406517

VALIDATION FINDINGS WORKSHEET
~~Compound Quantitation and Reported CRQLs~~
OVERALL ASSESSMENT

Reviewer: FM
2nd Reviewer: ee

METHOD: V GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	Tri-n-butyltin	exceeded cal range	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27	R/A
	Di-n-butyltin	lower result	7, 11, 13, 15, 17, 19, 23	R/A
	all except Tri-n-butyltin	diluted	2, 4, 6, 10, 22, 26, 28	R/A
	all except Tri-n-butyltin + Di-n-butyltin		8, 12, 14, 16, 18, 20, 24	R/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12662D19 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/0
SDG #: K2406581 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: R
2nd Reviewer: R

METHOD: GC Butyltins (Krone)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	~~none~~ if insufficient sample
IVc.	Laboratory control samples /SRM	A/A	LCSD
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

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

Validated Samples: Tissue

1	LDW-B7a-T	11	KWG0414914-3	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12662019
SDG #: K2406581

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

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

Y N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ SRM amount w/ acceptable limits

Level IV/D Only

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

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	NO SRM was analyzed for (Tetra-n-Butyltin		( )	( )	( )	All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	SRM = standard (reference (material		( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12662E19 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/04
SDG #: K2406932 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17 → 8/25/04 8/30/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	~~none~~ insufficient sample
IVc.	Laboratory control samples SRM	A	LCS ID
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

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

Validated Samples: Tissue

1 +	LDW-B8a-T	11	KWG0414914-3	21		31	
2 +	LDW-B10a-T	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12662F19
SDG #: K2407216

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Reviewer: RB
2nd Reviewer: RC

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

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ SRM amount w/ acceptable limits

Level IV/D Only

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

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	NO SRM was analyzed for (Tetra-n-Butyl)tin					All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			SRM = standard (reference material)				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12662F19 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/27/04
SDG #: K2407216 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26 – 8/27/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	~~none~~ insufficient sample
IVc.	Laboratory control samples / SRM	A / A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

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

Validated Samples: Tissue

1 †	LDW-B3a-T	11	KWG0414914-3	21		31	
2 †	LDW-B9a-T	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12662F19
SDG #: 1240721G

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Page: 1 of 1
Reviewer: BF
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

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

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ SRM amount w/ acceptable limits

Level IV/D Only

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

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	No SRM was analyzed for (Tetra-n-Butyl)tin		( )	( )	( )	All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			SRM = standard (reference material				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12734A19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407452 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	No MS/MSD insufficient sample
IVc.	Laboratory control samples SRM	A SW	LCS IP
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

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

Validated Samples: ~~Sediment~~ Tissue

1	LDW-B5a-T	11		21		31	
2	KWG0415205-4	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12734A19
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples (LCS)~~ SRM

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: ✓ GC __ HPLC

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

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

Level IV/D Only
Y N [✓ N/A] Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
			( )	( )	( )		
	SRM	No	SRM was)	analyzed for	( )	All + Blk	Text
			Tetra-n-	Butyltin)	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12734D19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407596 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: PD
2nd Reviewer: TC

METHOD: GC Butyltins (Krone)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27 - 9/28/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	No MS/MSD insufficient sample
IVc.	Laboratory control samples /SRM	A/SW	LCS/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

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

Validated Samples:
tissue

1 †	LDW-B4b-T	11		21		31	
2 †	LDW-B5b-T	12		22		32	
3 †	LDW-B1b-T	13		23		33	
4 †	LDW-B2b-T	14		24		34	
5	KWG0415205-4	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12734D19
SDG #: K2407596

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples (LCS)~~
SRM

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

Level [✓ IV/D] Only
Y N [✓ N/A] Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
			( )	( )	( )		
	SRM	No	SRM was)	analyzed for	( )	All + Blk	Text
			Tetra-n-)	butyltin)	( )	↓	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Attachment C-2: Sediment Chemistry

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Windward Environmental, LLC
200 West Mercer Street, Suite 401
Seattle, WA 98119
ATTN: Ms. Susie McGroddy

January 6, 2005

SUBJECT: Lower Duwamish Waterway Group Sediment Sample Data Validation

Dear Ms. McGroddy,

Enclosed is our revised EPA Level II and Level IV data validation of analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The primary analyses were performed by Columbia Analytical Services, Inc. Samples were analyzed for GC/MS Semivolatiles by EPA SW 846 Method 8270C, GC/MS Polynuclear Aromatic Hydrocarbons by EPA SW 846 Method 8270C-SIM, GC Butyltins by the Krone Method, GC Chlorinated Pesticides by EPA SW 846 Method 8081A, GC Polychlorinated Biphenyls by EPA SW 846 Method 8082, Metals by EPA SW 846 Methods 6010B/6020/7471A, and Total Organic Carbon and Particle Size by PSEP Method. Samples are referenced under the following Sample Delivery Groups: K2406516, K2406170, K2406226, K2406296, K2406519, K2406580, K2407012, K2407469, K2407471, K2407473, and K2407595.

Please feel free to contact us if you have any questions.

Sincerely,

Stella S. Cuenco
Project Manager/Senior Chemist

Attachment 1

Job #04-08-06-21 LDC #12631 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C)		PAHs (8270C -SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl -tins (Krone)		TOC (PSEP)		Particle Size																			
Matrix	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406516	10/18/04	11/08/04	0	14	0	15	0	19	0	14	0	14	0	14	0	14	0	14																	
Total	B			0	14	0	15	0	19	0	14	0	14	0	14	0	14	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	118

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12631ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12682 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	As (6020)																															
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2407469	10/26/04	11/16/04	0	12																														
B	K2407471	10/26/04	11/16/04	0	2																														
Total	B			0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12682ST.wpd

Job #04-08-06-21 LDC #12691 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C)		PAHs (8270C -SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl -tins (Krone)		TOC (PSEP)		Particle Size																	
Matrix	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406170	10/28/04	11/18/04	0	5	0	6	0	5	0	5	0	5	0	5	0	5	0	5														
B	K2406226	10/28/04	11/18/04	0	2	0	3	0	2	0	2	0	2	0	3	0	2	0	2														
C	K2406296	10/28/04	11/18/04	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3														
D	K2406519	10/28/04	11/18/04	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2														
E	K2406580	10/28/04	11/18/04	0	1	0	1	0	2	0	1	0	1	0	1	0	1	0	1														
F	K2407012	10/28/04	11/18/04	0	2	0	2	0	4	0	3	0	2	0	2	0	3	0	2														
Total	B			0	15	0	17	0	18	0	16	0	15	0	16	0	16	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	128

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12691STS.wpd

Attachment 1

Job #04-08-06-21 LDC #12734 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C)		PAHs (8270C -SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl -tins (Krone)		TOC (PSEP)		Particle Size																			
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
B	K2407473	11/05/04	11/26/04	0	1	-	-	0	1	0	1	0	1	0	1	0	1	0	1																	
C	K2407595	11/05/04	11/26/04	0	4	0	4	0	4	0	4	0	4	0	5	0	4	0	4																	
Total	B			0	5	0	4	0	5	0	5	0	5	0	6	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12734STS.wpd

Attachment 1

Job #04-08-06-21 LDC #12740 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	PAHs (8270C -SIM)																															
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2407473	11/09/04	11/30/04	0	1																														
Total	B			0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12740ST.wpd

CHEMICAL DATA QUALITY REVIEW FOR SEDIMENT SAMPLES

Lower Duwamish Waterway Group
LDC# 12631, 12682, 12691, 12734 & 12740

This report details the findings of an EPA Level II and Level IV data validation of analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The primary analyses were performed by Columbia Analytical Services, Inc. Samples were analyzed for GC/MS Semivolatiles by EPA SW 846 Method 8270C, GC/MS Polynuclear Aromatic Hydrocarbons by EPA SW 846 Method 8270C-SIM, GC Butyltins by the Krone Method, GC Chlorinated Pesticides by EPA SW 846 Method 8081A, GC Polychlorinated Biphenyls by EPA SW 846 Method 8082, Metals by EPA SW 846 Methods 6010B/6020/7471A, and Total Organic Carbon and Particle Size by PSEP Method. Samples are referenced under the following Sample Delivery Groups: K2406516, K2406170, K2406226, K2406296, K2406519, K2406580, K2407012, K2407469, K2407471, K2407473, and K2407595. See the Sample Analysis Table (Attachment 1) for the number of samples reviewed and the Sample Validation Table (Attachment 2) for the sample identifications and analyses. Sample IDs ending in "**" underwent Level IV review.

The QC guidelines used for data qualification are those specified in the National Functional Guidelines for Organic Data Review (October 1999) and the National Functional Guidelines for Inorganic Data Review (July 2002). Specific QC criteria used follows the Final Benthic Invertebrate Sampling of the Lower Duwamish Waterway Quality Assurance Project Plan (July 30, 2004). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The following items were evaluated during the review:

- Holding Times
- Sample Preservation
- Cooler Temperatures
- Instrument Calibration*
- Blanks
- Surrogates
- Matrix Spike/Matrix Spike Duplicates
- Internal Standards*
- Laboratory Control Samples
- Target Compound Identifications*
- Compound Quantitation and CRQLs*
- System Performance
- Field Duplicates

*Data were not reviewed for Level II.

Only issues which require comment or action are discussed in this report. Data deficiencies are arranged by method. Potential effects of data anomalies have been described where possible.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

Attachment 1

Job #04-08-06-21 **LDC #12631 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)**

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C)		PAHs (8270C -SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl -tins (Krone)		TOC (PSEP)		Particle Size																	
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406516	10/18/04	11/08/04	0	14	0	15	0	19	0	14	0	14	0	14	0	14	0	14																
Total	B			0	14	0	15	0	18	0	14	0	14	0	14	0	14	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	117

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12631ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12682 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	As (6020)																															
Matrix	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2407469	10/26/04	11/16/04	0	12																														
B	K2407471	10/26/04	11/16/04	0	2																														
Total	B			0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12682ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12691 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C)		PAHs (8270C -SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		As (1632)		Butyl -tins (Krone)		TOC (PSEP)		Particle Size													
Matrix: Tissue/Sediment				T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406170	10/28/04	11/18/04	0	5	0	6	0	5	0	5	0	5	-	-	0	5	0	5	0	5												
B	K2406226	10/28/04	11/18/04	0	2	0	3	0	2	0	2	0	2	-	-	0	3	0	2	0	2												
C	K2406296	10/28/04	11/18/04	0	3	0	3	0	3	0	3	0	3	-	-	0	3	0	3	0	3												
D	K2406519	10/28/04	11/18/04	0	2	0	2	0	2	0	2	0	2	-	-	0	2	0	2	0	2												
E	K2406580	10/28/04	11/18/04	0	1	0	1	0	2	0	1	0	1	-	-	0	1	0	1	0	1												
F	K2407012	10/28/04	11/18/04	0	2	0	2	0	4	0	3	0	2	-	-	0	2	0	3	0	2												
Total	B			0	15	0	17	0	18	0	16	0	15	0	0	0	16	0	16	0	15	0	0	0	0	0	0	0	0	0	0	0	128

Shaded cells indcate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12691ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12734 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	SVOA (8270C)		PAHs (8270C -SIM)		Pest. (8081A)		PCBs (8082)		Metals & Hg (SW846)		Butyl -tins (Krone)		TOC (PSEP)		Particle Size		Total Lipids (NOAA)													
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
B	K2407473	11/05/04	11/26/04	0	1	-	-	0	1	0	1	0	1	0	1	0	1	0	1	-	-												
C	K2407595	11/05/04	11/26/04	0	4	0	4	0	4	0	4	0	4	0	5	0	4	0	4	-	-												
Total	B			0	5	0	4	0	5	0	5	0	5	0	6	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12734ST.wpd

Attachment 1

Job #04-08-06-21 LDC #12740 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	PAHs (8270C -SIM)																													
Matrix: Tissue/Sediment				T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2407473	11/09/04	11/30/04	0	1																												
Total	B			0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

12740ST.wpd

Attachment 2

SDG#: K2406516 VALIDATION SAMPLE TABLE **LDC#:** 12631A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size				
LDW-C4-S	K2406516-001	sediment	08/27/04	X	X	X	X	X	X	X	X				
LDW-C10-S2	K2406516-002	sediment	08/25/04	X	X	X	X	X	X	X	X				
LDW-C10-S2DL	K2406516-002DL	sediment	08/25/04			X									
LDW-C10-S1	K2406516-003	sediment	08/25/04	X	X	X	X	X	X	X	X				
LDW-C10-S1DL	K2406516-003DL	sediment	08/25/04			X									
LDW-C10-S1DL2	K2406516-003DL2	sediment	08/25/04			X									
LDW-C6-S	K2406516-004	sediment	08/25/04	X	X	X	X	X	X	X	X				
LDW-C9-S	K2406516-005	sediment	08/25/04	X	X	X	X	X	X	X	X				
LDW-C7-S1	K2406516-006	sediment	08/26/04	X	X	X	X	X	X	X	X				
LDW-C7-S1DL	K2406516-006DL	sediment	08/26/04			X									
LDW-C3-S2	K2406516-007	sediment	08/27/04	X	X	X	X	X	X	X	X				
LDW-C7-S2	K2406516-008	sediment	08/26/04	X	X	X	X	X	X	X	X				
LDW-C8-S	K2406516-009	sediment	08/26/04	X	X	X	X	X	X	X	X				
LDW-C8-SDL	K2406516-009DL	sediment	08/26/04		X	X									
LDW-C5-S	K2406516-010	sediment	08/27/04	X	X	X	X	X	X	X	X				
LDW-C3-S1	K2406516-011	sediment	08/27/04	X	X	X	X	X	X	X	X				
LDW-C2-S1	K2406516-012	sediment	08/26/04	X	X	X	X	X	X	X	X				
LDW-C2-S2	K2406516-013	sediment	08/26/04	X	X	X	X	X	X	X	X				
LDW-C1-S	K2406516-014	sediment	08/26/04	X	X	X	X	X	X	X	X				
LDW-C4-SMS	K2406516-001MS	sediment	08/27/04					X		X					
LDW-C4-SDUP	K2406516-001DUP	sediment	08/27/04					X		X	X				
LDW-C4-STRP	K2406516-001TRP	sediment	08/27/04							X	X				
LDW-C9-SMS	K2406516-005MS	sediment	08/25/04			X			X						
LDW-C9-SMSD	K2406516-005MSD	sediment	08/25/04			X			X						
LDW-C3-S2MS	K2406516-007MS	sediment	08/27/04					X							

Note: X = Validation was performed.

12631VALA.wpd

SDG#: K2406516 VALIDATION SAMPLE TABLE **LDC#:** 12631A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size				
LDW-C3-S2DUP	K2406516-007DUP	sediment	08/27/04					X							
LDW-C5-SMS	K2406516-010MS	sediment	08/27/04	X											
LDW-C5-SMSD	K2406516-010MSD	sediment	08/27/04	X											
LDW-C5-SDUP	K2406516-010DUP	sediment	08/27/04	X											
LDW-C2-S2MS	K2406516-013MS	sediment	08/26/04			X									
LDW-C2-S2MSD	K2406516-013MSD	sediment	08/26/04			X									
LDW-C2-S2DUP	K2406516-013DUP	sediment	08/26/04			X	X		X						
LDW-C1-SMS	K2406516-014MS	sediment	08/26/04		X		X								
LDW-C1-SMSD	K2406516-014MSD	sediment	08/26/04		X		X								
LDW-C1-SDUP	K2406516-014DUP	sediment	08/26/04		X										

Note: X = Validation was performed.

12631VALA.wpd

Attachment 2

SDG#: K2407469 VALIDATION SAMPLE TABLE **LDC#:** 12682A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	As (6020)											
SP-C-S1	K2407469-001	soil	09/23/04	X											
SP-C-S2	K2407469-002	soil	09/23/04	X											
SP-C-S3	K2407469-003	soil	09/23/04	X											
SP-C-S4	K2407469-004	soil	09/23/04	X											
SP-C-S5	K2407469-005	soil	09/23/04	X											
SP-C-S6	K2407469-006	soil	09/23/04	X											
B1-C-S1	K2407469-007	soil	09/23/04	X											
B1-C-S2	K2407469-008	soil	09/24/04	X											
B1-C-S3	K2407469-009	soil	09/24/04	X											
B1-C-S4	K2407469-010	soil	09/24/04	X											
B1-C-S5	K2407469-011	soil	09/24/04	X											
B1-C-S6	K2407469-012	soil	09/23/04	X											
SP-C-S2MS	K2407469-002MS	soil	09/23/04	X											
SP-C-S2DUP	K2407469-002DUP	soil	09/23/04	X											

Note: X = Validation was performed.

12682VALA.wpd

Attachment 2

SDG#: K2407471 VALIDATION SAMPLE TABLE **LDC#:** 12682B

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	As (6020)											
LDW-BL-S-1	K2407471-001	sediment	09/16/04	X											
LDW-EP-S1	K2407471-003	sediment	09/17/04	X											

Note: X = Validation was performed.

12682VALB.wpd

Attachment 2

SDG#: K2406170 VALIDATION SAMPLE TABLE **LDC#:** 12691A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-B2a-S	K2406170-001	sediment	08/13/04	X	X	X	X	X	X	X	X				
LDW-B6a-S	K2406170-002	sediment	08/15/04	X	X	X	X	X	X	X	X				
LDW-B4a-S	K2406170-003	sediment	08/14/04	X	X	X	X	X	X	X	X				
LDW-B4a-SDL	K2406170-003DL	sediment	08/14/04		X										
LDW-B1a-S	K2406170-004	sediment	08/11/04	X	X	X	X	X	X	X	X				
LDW-B9b-S	K2406170-005	sediment	08/16/04	X	X	X	X	X	X	X	X				
LDW-B2a-SMS	K2406170-001MS	sediment	08/13/04					X							
LDW-B2a-SDUP	K2406170-001DUP	sediment	08/13/04					X			X				
LDW-B2a-STRP	K2406170-001TRP	sediment	08/13/04								X				
LDW-B6a-SMS	K2406170-002MS	sediment	08/15/04			X									
LDW-B6a-SMSD	K2406170-002MSD	sediment	08/15/04			X									
LDW-B1a-SMS	K2406170-004MS	sediment	08/11/04		X	X			X						
LDW-B1a-SMSD	K2406170-004MSD	sediment	08/11/04		X	X			X						
LDW-B1a-SDUP	K2406170-004DUP	sediment	08/11/04		X				X						

Note: X = Validation was performed.

12691VALA.wpd

Attachment 2

SDG#: K2406226 VALIDATION SAMPLE TABLE **LDC#:** 12691B

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-B7b-S	K2406226-001	sediment	08/13/04	X	X	X	X	X	X	X	X				
LDW-B3b-S	K2406226-002	sediment	08/10/04	X	X	X	X	X	X	X	X				
LDW-B3b-SDL	K2406226-002DL	sediment	08/10/04		X				X						
LDW-B7b-SMS	K2406226-001MS	sediment	08/13/04							X					
LDW-B7b-SDUP	K2406226-001DUP	sediment	08/13/04							X					
LDW-B7b-STRP	K2406226-001TRP	sediment	08/13/04							X					

Note: X = Validation was performed.

12691VALB.wpd

Attachment 2

SDG#: K2406296 VALIDATION SAMPLE TABLE **LDC#:** 12691C

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-B6b-S	K2406296-001	sediment	08/18/04	X	X	X	X	X	X	X	X				
LDW-B8b-S	K2406296-002	sediment	08/19/04	X	X	X	X	X	X	X	X				
LDW-B10b-S	K2406296-003	sediment	08/19/04	X	X	X	X	X	X	X	X				
LDW-B6b-SMS	K2406296-001MS	sediment	08/18/04					X							
LDW-B6b-SDUP	K2406296-001DUP	sediment	08/18/04					X							

Note: X = Valication was performed.

12691VALC.wpd

Attachment 2

SDG#: K2406519 | VALIDATION SAMPLE TABLE | **LDC#:** 12691D

Project Name: Lower Duwamish Waterway Group | Parameters/Analytical Method | Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-B9a-S	K2406519-001	sediment	08/27/04	X	X	X	X	X	X	X	X				
LDW-B3a-S	K2406519-005	sediment	08/26/04	X	X	X	X	X	X	X	X				
LDW-B9a-SMS	K2406519-001MS	sediment	08/27/04					X							
LDW-B9a-SDUP	K2406519-001DUP	sediment	08/27/04					X							
LDW-B3a-SMS	K2406519-005MS	sediment	08/26/04				X								
LDW-B3a-SMSD	K2406519-005MSD	sediment	08/26/04				X								

Note: X = Valication was performed.

12691VALD.wpd

Attachment 2

SDG#: K2406580 VALIDATION SAMPLE TABLE **LDC#:** 12691E

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-B7a-S	K2406580-001	sediment	08/30/04	X	X	X	X	X	X	X	X				
LDW-B7a-SDL	K2406580-001DL	sediment	08/30/04			X									
LDW-B7a-SMS	K2406580-001MS	sediment	08/30/04		X				X						
LDW-B7a-SMSD	K2406580-001MSD	sediment	08/30/04		X				X						
LDW-B7a-SDUP	K2406580-001DUP	sediment	08/30/04		X				X						

Note: X = Validation was performed.

12691VALE.wpd

Attachment 2

SDG#: K2407012 VALIDATION SAMPLE TABLE **LDC#:** 12691F

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-B5a-S	K2407012-003	sediment	08/16/04			X	X			X					
LDW-B8a-S	K2407012-006	sediment	08/17/04	X	X	X	X	X	X	X	X				
LDW-B8a-SDL	K2407012-006DL	sediment	08/17/04			X									
LDW-B10a-S	K2407012-009	sediment	08/25/04	X	X	X	X	X	X	X	X				
LDW-B5a-SDUP	K2407012-003DUP	sediment	08/16/04			X	X								
LDW-B8a-SMS	K2407012-006MS	sediment	08/17/04					X							
LDW-B8a-SDUP	K2407012-006DUP	sediment	08/17/04					X							

Note: X = Validation was performed.

12691VALF.wpd

Attachment 2

SDG#: K2407473 VALIDATION SAMPLE TABLE **LDC#:** 12734B

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LDW-B5a-S	K2407473-001	sediment	09/24/04	X		X	X	X	X	X	X				
LDW-B5a-SMS	K2407473-001MS	sediment	09/24/04					X		X					
LDW-B5a-SDUP	K2407473-001DUP	sediment	09/24/04					X		X	X				
LDW-B5a-STRP	K2407473-001TRP	sediment	09/24/04							X	X				

Note: X = Validation was performed.

12734VALB.wpd

Attachment 2

SDG#: K2407595 VALIDATION SAMPLE TABLE **LDC#:** 12734C

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	Metals (SW846	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	Total Lipids (NOAA)			
LDW-B1b-S	K2407595-001	sediment	09/27/04	X	X	X	X	X	X	X	X				
LDW-B1b-SDL	K2407595-001DL	sediment	09/27/04						X						
LDW-B2b-S	K2407595-002	sediment	09/27/04	X	X	X	X	X	X	X	X				
LDW-B4b-S	K2407595-003	sediment	09/28/04	X	X	X	X	X	X	X	X				
LDW-B5b-S	K2407595-004	sediment	09/28/04	X	X	X	X	X	X	X	X				
LDW-B1b-SMS	K2407595-001MS	sediment	09/27/04		X	X		X							
LDW-B1b-SMSD	K2407595-001MSD	sediment	09/27/04		X	X									
LDW-B1b-SDUP	K2407595-001DUP	sediment	09/27/04		X		X	X							
LDW-B2b-SMS	K2407595-002MS	sediment	09/27/04	X		X									
LDW-B2b-SMSD	K2407595-002MSD	sediment	09/27/04	X		X									
LDW-B2b-SDUP	K2407595-002DUP	sediment	09/27/04	X											
LDW-B5b-SMS	K2407595-004MS	sediment	09/28/04				X		X						
LDW-B5b-SMSD	K2407595-004MSD	sediment	09/28/04				X		X						
LDW-B5b-SDUP	K2407595-004DUP	sediment	09/28/04			X			X						

Note: X = Validation was performed.

12734VALC.wpd

Attachment 2

SDG#: K2407473 VALIDATION SAMPLE TABLE **LDC#:** 12740A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270C)	PAHs (8270C -SIM)	Pest. (8081A)	PCBs (8082)	As (6010B)	Butyl -tins (Krone)	TOC (PSEP)	Particle Size	% Lipids (NOAA)			
LDW-B5a-S	K2407473-001	sediment	09/24/04		X										
LDW-B5a-SMS	K2407473-001MS	sediment	09/24/04		X										
LDW-B5a-SMSD	K2407473-001MSD	sediment	09/24/04		X										

Note: X = Validation was performed.

12740VALA.wpd

Overall Data Assessment

QC exceedances, compound identification, compound quantitation, instrument calibration, and method blank contamination problems have warranted the qualification of a portion of the data set.

Zero percent recoveries of Benzidine in the LCS /LCSD have warranted the qualification of non-detected results for Benzidine as rejected (R) in the semivolatile analyses for SDGs K2406516, K2406170, K2406226, K2406296, K2406519, K2406580, K2407012, K2407473 and K2407595. This compound is known to have poor recoveries when analyzed by method 8270C.

Compound identification problems have warranted the qualification of detected results as presumptive and estimated (NJ) in the pesticide analysis for SDG K2406170.

Compound quantitation problems have warranted the qualification of detected results as estimated (J) in the polynuclear aromatic hydrocarbon analyses for SDGs K2406516, K2406170 and K2406226, in the pesticide analyses for SDGs K2406516, K2406580, K2407012, K2406170, K2406226, K2406296, K2406519, K247473 and K2407595, in the PCB analyses for SDGs K2406516, K2406296 and K2407012 and in the butyltin analyses for SDGs K2406226, K2407595.

Instrument calibration problems have warranted the qualification of detected results as estimated (J) and non-detected results as estimated (UJ) for hexachlorocyclopentadiene in the semivolatile analysis for SDG K2406170 and for methoxychlor in the pesticide analysis for SDG K2406170.

Method blank contamination have warranted the qualification of several compounds. Phenol was qualified as non-detected (U) in the semivolatile analysis for SDGs K2406170, K2406226, K2406296, K2406580, K2407012 and K2407595 and bis(2-ethylhexylphthalate was qualified as non-detected (U) in SDGs K2406170 and K2407012. Naphthalene was qualified as non-detected (U) in the polynuclear aromatic hydrocarbon analyses for SDGs K2406296, K2406580, K2407012 and K2407595. Thallium and silver was qualified as non-detected (U) in the metals analysis for SDG K2406170.

QC exceedances have warranted the qualification of detected results for semivolatile, polynuclear aromatic hydrocarbon, pesticide, PCB, metal and butyltin data as estimated (J) and non-detected results as estimated (UJ) in SDGs K2406296, K2407473, SDG K2407595, K2406516, K2406170, K2406226, K2406519, K2406580 and K2407012.

The required frequency of MS and Duplicate analyses was not met for Mercury.

The required frequency of SRM analysis was not met for the semivolatile analyses. However, SRM analysis was performed for the polynuclear aromatic hydrocarbons analyses.

*Field duplicates were not collected for this sampling event.

Based upon the information reviewed, the overall data quality is considered acceptable with the noted limitations.

GC/MS Semivolatiles by EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM)

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406170	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory, however the laboratory indicated that the samples were then immediately stored frozen.

II. GC/MS Instrument Performance Check

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

Instrument performance check data were not reviewed for Level II.

III. Initial Calibration

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

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

Initial calibration data were not reviewed for Level II.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

The percent difference (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds with the following exceptions:

Associated SDG	Date	Compound	%D	Associated Samples	Flag	A or P
K2406170	9/26/04	Hexachlorocyclopentadiene	26	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S**	J (all detects) UJ (all non-detects)	A

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

Continuing calibration data were not reviewed for Level II.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0414281-5	9/22/04	Phenol Bis(2-ethylhexyl)phthalate	3.2 ug/Kg 3.0 ug/Kg	All samples in SDG K2406170/K2406226 /K2406296K2406519 /K2406580/K2407012
KWG0415420-5	10/8/04	Phenol Bis(2-ethylhexyl)phthalate	2.4 ug/Kg 2.2 ug/Kg	All samples in SDG K2407473/K2407595

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Associated SDG	Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
K2406170	LDW-B6a-S** (2x)	Phenol	31 ug/Kg	60U ug/Kg
K2406170	LDW-B4a-S** (2x)	Phenol	23 ug/Kg	60U ug/Kg
K2406170	LDW-B1a-S**	Bis(2-ethylhexyl)phthalate	15 ug/Kg	200U ug/Kg
K2406226	LDW-B7b-S (2x)	Phenol	10 ug/Kg	60U ug/Kg
K2406226	LDW-B3b-S (5x)	Phenol	52 ug/Kg	150U ug/Kg
K2406296	LDW-B8b-S	Phenol	7.3 ug/Kg	32U ug/Kg

Associated SDG	Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
K2406296	LDW-B10b-S	Phenol	10 ug/Kg	30U ug/Kg
K2406580	LDW-B7a-S (2x)	Phenol	13 ug/Kg	60U ug/Kg
K2407012	LDW-D10a-S (2x)	Phenol Bis(2-ethylhexyl)phthalate	1100 ug/Kg 39 ug/Kg	1100U ug/Kg 400U ug/Kg
K2407595	LDW-B5b-S	Phenol	11 ug/Kg	30U ug/Kg

VI. Surrogate Spikes

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

Associated SDG	Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
K2406296	LDW-B8b-S	Nitrobenzene-d5 2-Fluorobiphenyl	38 (40-130) 25 (40-130)	Bis(2-chloroethyl)ether 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone Bis(2-chloroethoxy)methane 1,2,4-Trichlorobenzene 4-Chloroaniline Hexachlorobutadiene Hexachlorocyclopentadiene 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate 2,6-Dinitrotoluene 3-Nitroaniline 2,4-Dinitrophenol Diethylphthalate 4-Chlorophenyl-phenyl ether 4-Nitroaniline N-Nitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene Carbazole Di-n-butylphthalate Butylbenzylphthalate 3,3'-Dichlorobenzidine Bis(2-ethylhexyl)phthalate Di-n-octylphthalate Bis(2-chloroisopropyl)ether Aniline N-Nitrosodimethylamine Benzyl alcohol Benzidine	J (all detects) UJ (all non-detects)	P

Associated SDG	Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
K2406296	LDW-B10b-S	Nitrobenzene-d5 2-Fluorobiphenyl	28 (40-130) 31 (40-130)	Bis(2-chloroethyl)ether 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone Bis(2-chloroethoxy)methane 1,2,4-Trichlorobenzene 4-Chloroaniline Hexachlorobutadiene Hexachlorocyclopentadiene 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate 2,6-Dinitrotoluene 3-Nitroaniline 2,4-Dinitrophenol Diethylphthalate 4-Chlorophenyl-phenyl ether 4-Nitroaniline N-Nitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene Carbazole Di-n-butylphthalate Butylbenzylphthalate 3,3'-Dichlorobenzidine Bis(2-ethylhexyl)phthalate Di-n-octylphthalate Bis(2-chloroisopropyl)ether Aniline N-Nitrosodimethylamine Benzyl alcohol Benzidine	J (all detects) UJ (all non-detects)	P

Associated SDG	Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
K2407473	LDW-B5a-S	Nitrobenzene-d5 2-Fluorobiphenyl	31 (40-130) 24 (40-130)	Bis(2-chloroethyl)ether 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone Bis(2-chloroethoxy)methane 1,2,4-Trichlorobenzene 4-Chloroaniline Hexachlorobutadiene Hexachlorocyclopentadiene 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate 2,6-Dinitrotoluene 3-Nitroaniline 2,4-Dinitrotoluene Diethylphthalate 4-Chlorophenyl-phenyl ether 4-Nitroaniline N-Nitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene Carbazole Di-n-butylphthalate Butylbenzylphthalate 3,3'-Dichlorobenzidine Bis(2-ethylhexyl)phthalate Di-n-octylphthalate Bis(2-chloroisopropyl)ether Aniline N-Nitrosodimethylamine Benzyl alcohol Benzidine	J (all detects) UJ (all non-detects)	P

Associated SDG	Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
K2407595	LDW-B4b-S	Nitrobenzene-d5 2-Fluorobiphenyl	39 (40-130) 28 (40-130)	Bis(2-chloroethyl)ether 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone Bis(2-chloroethoxy)methane 1,2,4-Trichlorobenzene 4-Chloroaniline Hexachlorobutadiene Hexachlorocyclopentadiene 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate 2.6-Dinitrotoluene 3-Nitroaniline 2,4-Dinitrotoluene Diethylphthalate 4-Chlorophenyl-phenyl ether 4-Nitroaniline N-Nitrosodiphenylamine 4-Bromophenyl-phenylether Hexachlorobenzene Carbazole Di-n-butylphthalate Butylbenzylphthalate 3,3'-Dichlorobenzidine Bis(2-ethylhexyl)phthalate Di-n-octylphthalate Bis(2-chloroisopropyl)ether Aniline N-Nitrosodimethylamine Benzyl alcohol Benzidine	J (all detects) UJ (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits in SDG K2406516 and K2407595 with the following exceptions:

Associated SDG	Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
K2407595	LDW-B2b-SMS/MSD (LDW-B2b-S)	1,4-Dichlorobenzene	-	38 (40-130)	-	J (all detects) UJ (all non-detects)	A

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits in SDG K2406516 and K2407595.

VIII. Laboratory Control Samples (LCS)

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

Associated SDG	LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
K2406516	KWG0413228-3/4 (All samples in SDG)	2,4-Dimethylphenol Benzoic acid	30 (40-130) -	24 (40-130) 39 (40-130)	- -	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
K2406516	KWG0413228-3/4 (All samples in SDG)	Benzidine	0 (40-130)	0 (40-130)	-	J (all detects) R (all non-detects)	P
K2406170 K2406226 K2406296 K2406519 K2406580 K2407012	KWG0414281-3/4 (All samples in SDGs)	2,4-Dimethylphenol	30 (40-130)	39 (40-130)	-	J (all detects) UJ (all non-detects)	P
K2406170 K2406226 K2406296 K2406519 K2406580 K2407012	KWG0414281-3/4 (All samples in SDGs)	Benzidine	0 (40-130)	0 (40-130)	-	J (all detects) R (all non-detects)	P
K2407473 K2407595	KWG0415420-3/4 (All samples in SDGs)	Aniline 2,4-Dimethylphenol 4-Chloroaniline Hexachlorocyclopentadiene	25 (40-130) - - 31 (40-130)	15 (40-130) 29 (40-130) 38 (40-130) 33 (40-130)	- 60 (≤50) - -	J (all detects) UJ (all non-detects)	P
K2407473 K2407595	KWG0415420-3/4 (All samples in SDGs)	Benzidine	0 (40-130)	0 (40-130)	-	J (all detects) R (all non-detects)	P

No standard reference material analysis associated with samples in these SDGs.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

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

Internal standards data were not reviewed for Level II.

XI. Target Compound Identifications

All target compound identifications were within validation criteria.

Target compound identifications data were not reviewed for Level II.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria.

Compound quantitation and CRQLs data were not reviewed for Level II.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory for Level IV.

Tentatively identified compounds data were not reviewed for Level II.

XIV. System Performance

The system performance was acceptable.

System performance data were not reviewed for Level II.

XV. Overall Assessment

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

***XVI. Field Duplicates**

No field duplicates were identified in these SDGs.

XVII. Field Blanks

No field blanks were identified in these SDGs.

Polynuclear Aromatic Hydrocarbons and Alkylated Polynuclear Aromatic Hydrocarbons by EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM).

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406170	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B4a-SDL** LDW-B1a-S** LDW-B9b-S**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory, however the laboratory indicated that the samples were then immediately stored frozen.

II. GC/MS Instrument Performance Check

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

Instrument performance check data were not reviewed for Level II.

III. Initial Calibration

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

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

Initial calibration data were not reviewed for Level II.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

The percent difference (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

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

Continuing calibration data were not reviewed for Level II.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0413012-5	9/1/04	Naphthalene	0.51 ug/Kg	All samples in SDG K2406516
KWG0414432-7	9/22/04	Naphthalene	0.59 ug/Kg	All samples in SDGs K2406170/K2406226/ K2406296/K2406519/
KWG0413278-4	9/3/04	Naphthalene 2-Methylnaphthalene	0.78 ug/Kg 0.35 ug/Kg	All samples in SDG K2406580
KWG0416619-6	10/25/04	Naphthalene	0.87 ug/Kg	All samples in SDG K2407473
KWG0415421-9	10/8/04	Naphthalene	1.0 ug/Kg	All samples in SDG K2407595

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Associated SDG	Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
K2406296	LDW-B10b-S	Naphthalene	2.5 ug/Kg	5.0U ug/Kg
K2406580	LDW-B7a-S	Naphthalene	3.5 ug/Kg	4.7U ug/Kg
K2407012	LDW-B10a-S	Naphthalene	2.8 ug/Kg	5.0U ug/Kg
K2407595	LDW-B1b-S	Naphthalene	4.4 ug/Kg	5.0U ug/Kg

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits in SDGs K2406170, K2406580, K2407473, and K2407595 with the following exceptions:

Associated SDG	Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
K2407473	LDW-B5a-SMS/MSD (LDW-B5a-S)	Benzo(b)fluoranthene Indeno(1,2,3-cd)pyrene	133 (40-130) 134 (40-130)	- -	- -	J (all detects) J (all detects)	A
K2407595	LDW-B1b-SMS/MSD (LDW-B1b-S)	Naphthalene 2-Methylnaphthalene Biphenyl Acenaphthylene Fluorene Dibenzothiophene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(e)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	- - - - - - - - 168 (40-130) 158 (40-130) - - - - - - - - - -	379 (40-130) 164 (40-130) 187 (40-130) 273 (40-130) 165 (40-130) 232 (40-130) 1521 (40-130) 603 (40-130) 6981 (40-130) 7231 (40-130) 2637 (40-130) 3175 (40-130) 3370 (40-130) 1447 (40-130) 2688 (40-130) 3802 (40-130) 1169 (40-130) 3041 (40-130) 413 (40-130) 3419 (40-130)	119 (≤50) 61 (≤50) 71 (≤50) 103 (≤50) 65 (≤50) 102 (≤50) 169 (≤50) 148 (≤50) 189 (≤50) 190 (≤50) 188 (≤50) 187 (≤50) 190 (≤50) 179 (≤50) 187 (≤50) 182 (≤50) 164 (≤50) 191 (≤50) 152 (≤50) 190 (≤50)	J (all detects) UJ (all non-detects)	A
K2407595	LDW-B1b-SMS/MSD (LDW-B1b-S)	1-Methylnaphthalene Dibenzofuran Acenaphthene	- - -	144 (40-130) 146 (40-130) 144 (40-130)	- - -	J (all detects) J (all detects) J (all detects)	A

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits for SDGs K2406516, K2406170, K2406580, and K2407595 with the following exceptions:

Associated SDG	DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
K2406170	LDW-B1a-SDUP** (LDW-B1a-S**)	C1-Phenanthrene/Anthracene C2-Phenanthrene/Anthracene C3-Phenanthrene/Anthracene	57 (≤50) 61 (≤50) 88 (≤50)	J (all detects) J (all detects) J (all detects)	A
K2406580	LDW-B7a-SDUP (LDW-B7a-S)	Phenanthrene Anthracene Perylene	57 (≤50) 58 (≤50) 56 (≤50)	J (all detects) J (all detects) J (all detects)	A

*Indicates change as the result of report review.

Associated SDG	DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
K2407595	LDW-B1b-SDUP (LDW-B1b-S)	Fluoranthene	51 (≤50)	J (all detects)	A
		Benzo(b)fluoranthene	66 (≤50)	J (all detects)	
		Benzo(k)fluoranthene	60 (≤50)	J (all detects)	
		Benzo(e)pyrene	76 (≤50)	J (all detects)	
		Benzo(a)pyrene	81 (≤50)	J (all detects)	
		Indeno(1,2,3-cd)pyrene	98 (≤50)	J (all detects)	
		Benzo(g,h,i)perylene	102 (≤50)	J (all detects)	

VIII. Laboratory Control Samples (LCS)

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

Standard reference material were within QC limits.

No standard reference material analysis for Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Dibenzofuran, Acenaphthene, Fluorene, Anthracene, and Dibenz(a,h)anthracene were associated with the samples in SDGs K2406516, K2406170, K2406226, K2406296, K2406519, K2406580, K2407012, K2407476, K2407473, and K2407595.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits in SDG K2406170.

Internal standards data were not reviewed for Level II.

XI. Target Compound Identifications

All target compound identifications were within validation criteria.

Target compound identifications data were not reviewed for Level II.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding	Criteria	Flag	A or P
K2406516	LDW-C8-S	Phenanthrene Fluoranthene Pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)anthracene Chrysene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406170	LDW-B4a-S**	Phenanthrene Fluoranthene Pyrene C1-Fluoranthenes/Pyrenes Chrysene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406226	LDW-B3b-S	Fluoranthene Pyrene Benzo(a)anthracene C1-Fluoranthenes/Pyrenes Chrysene C1-Chrysene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A

Compound quantitation and CRQLs data were not reviewed for Level II.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory for Level IV.

Tentatively identified compounds data were not reviewed for Level II.

XIV. System Performance

The system performance was acceptable.

System performance data were not reviewed for Level II.

XV. Overall Assessment

The overall assessment of data was acceptable. In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Associated SDG	Sample	Compound	Flag	A or P
K2406516	LDW-C8-S	Phenanthrene Fluoranthene Pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)anthracene Chrysene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	R R R R R R R R R R	A
K2406516	LDW-C8-SDL	All TCL compounds except Phenanthrene Fluoranthene Pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)anthracene Chrysene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	R	A
K2406170	LDW-B4a-S**	Phenanthrene Fluoranthene Pyrene C1-Fluoranthenes/Pyrenes Chrysene	R R R R R	A
K2406170	LDW-B4a-SDL**	All TCL compounds except Phenanthrene Fluoranthene Pyrene C1-Fluoranthenes/Pyrenes Chrysene	R	A
K2406226	LDW-B3b-S	Fluoranthene Pyrene Benzo(a)anthracene C1-Fluoranthenes/Pyrenes Chrysene C1-Chrysene	R R R R R R	A
K2406226	LDW-B3b-SDL	All TCL compounds except Fluoranthene Pyrene Benzo(a)anthracene C1-Fluoranthenes/Pyrenes Chrysene C1-Chrysene	R	A

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

*XVI. Field Duplicates

No field duplicates were identified in these SDGs.

XVII. Field Blanks

No field blanks were identified in these SDGs.

GC Chlorinated Pesticides by EPA SW 846 Method 8081A

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406170	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory, however the laboratory indicated that the samples were then immediately stored frozen.

II. GC/ECD Instrument Performance Check

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

Instrument performance check data were not reviewed for Level II.

III. Initial Calibration

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

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

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

Retention time windows were evaluated and considered technically acceptable.

Initial calibration data were not reviewed for Level II.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

Associated SDG	Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
K2406170	10/7/04	1006F046_049	DB-XLB	Methoxychlor	16	LDW-B9b-S**	J (all detects) UJ (all non-detects)	A
K2406170	10/7/04	1006F046_049	DB-35MS	Methoxychlor	16	LDW-B9b-S**	J (all detects) UJ (all non-detects)	A

The percent difference (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

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

Retention times (RT) of all compounds in the calibration standards were within QC limits.

Continuing calibration data were not reviewed for Level II.

V. Blanks

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

VI. Surrogate Spikes

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

Associated SDG	Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
K2406516	LDW-C10-S2	Decachlorobiphenyl	46 (50-150)	All TCL compounds	J (all detects) UJ (all non-detects)	A

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Associated SDG	Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
K2406170	LDW-B6a-SMS/MSD** (LDW-B6a-S**)	gamma-Chlordane	-	-	57 (≤50)	J (all detects) UJ (all non-detects)	A
		Endosulfan I	44 (50-150)	-	-		
		4,4'-DDE	-	36 (50-150)	-		
		Endosulfan II	47 (50-150)	-	57 (≤50)		
		Endrin aldehyde	49 (50-150)	-	-		
		4,4'-DDT	29 (50-150)	-	74 (≤50)		
		Methoxychlor	49 (50-150)	-	-		

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

Associated SDG	DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
K2407012	LDW-B5a-SDUP (LDW-B5a-S)	4,4'-DDE	64 (≤50)	J (all detects)	A
		4,4'-DDD	91 (≤50)		
		4,4'-DDT	82 (≤50)		
		2,4'-DDD	78 (≤50)		
		2,4'-DDT	80 (≤50)		

VIII. Laboratory Control Samples (LCS)

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

Associated SDG	LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
K2407473 K2407595	KWG041671-5/6 (LDW-B5a-S LDW-B1b-S LDW-B2b-S LDW-B4b-S LDW-B5b-S)	Endrin aldehyde	-	25 (50-150)	67 (≤50)	J (all detects) UJ (all non-detects)	P

Standard reference material were within QC limits with the following exceptions:

Associated SDG	SRM ID	Compound	Concentration (Limits)	Associated Samples	Flag	A or P
K2406516	SRM 1944	gamma-Chlordane	32 ug/Kg (3.0-15)	LDW-C4-S LDW-C10-S2 LDW-C10-S2DL LDW-C10-S1 LDW-C10-S1DL LDW-C6-S LDW-C9-S LDW-C7-S1 LDW-C7-S1DL LDW-C3-S2 LDW-C7-S2 LDW-C8-S LDW-C8-SDL LDW-C5-S LDW-C3-S1 LDW-C2-S1 LDW-C2-S2 LDW-C1-S LDW-C10-S1DL2	J (all detects)	P
K2406170 K2406226 K2406296 K2406519 K2406580 K2407012	SRM 1944	alpha-BHC	5.95 ug/Kg (0.85-3.5)	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S** LDW-B7b-S LDW-B3b-S LDW-B6b-S LDW-B8b-S LDW-B10b-S LDW-B9a-S LDW-B3a-S LDW-B7a-S LDW-B7a-SDL LDW-B5a-S LDW-B8a-S LDW-B8a-SDL LDW-B10a-S	J (all detects)	P
K2407473 K2407595	SRM 1944	2,4'-DDD gamma-Chlordane	74 ug/Kg (15-69) 31 ug/Kg (3.0-15)	LDW-B5a-S LDW-B1b-S LDW-B2b-S LDW-B4b-S LDW-B5b-S	J (all detects) J (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Although florisil cleanup was not required by the method, it was performed by the laboratory for EPA Level IV.

Florisil cartridge check data were not reviewed for Level II.

b. GPC Calibration

Although GPC cleanup was not required by the method, GPC cleanup was performed by the laboratory for EPA Level IV.

GPC cleanup data were not reviewed for Level II.

XI. Target Compound Identification

All target compound identifications were within validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding	Flag	A or P
K2406170	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S**	All detected compounds	Due to the presence of PCBs, all detected results were qualified as presumptive and estimated.	NJ (all detects)	A

Target compound identifications data were not reviewed for Level II.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding	Criteria	Flag	A or P
K2406516	LDW-C10-S2	Endrin ketone 2,4'-DDD	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A
K2406516	LDW-C10-S1	2,4'-DDD	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
K2406516	LDW-C8-S	gamma-Chlordane 4,4'-DDT 2,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A
K2406580	LDW-B7a-S	Hexachlorobenzene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
K2407012	LDW-B8a-S	Endrin ketone Toxaphene 2,4'-DDD 2,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects)	A

The sample results for detected compounds from the two columns were within 40.0% relative percent differences (RPD) with the following exceptions:

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2406516	LDW-C4-S	4,4'-DDE	67	J (all detects)	A
K2406516	LDW-C10-S2	Mirex	46	J (all detects)	A
K2406516	LDW-C10-S1	2,4-DDD	43	J (all detects)	A
K2406516	LDW-C6-S	4,4'-DDE	76	J (all detects)	A
K2406516	LDW-C9-S	alpha-Chlordane 2,4-DDD	67 82	J (all detects) J (all detects)	A
K2406516	LDW-C7-S1	gamma-BHC delta-BHC Endosulfan I Endrin aldehyde	97 67 67 43	J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406516	LDW-C3-S2	Endrin aldehyde	58	J (all detects)	A
K2406516	LDW-C7-S2	Endrin aldehyde	74	J (all detects)	A
K2406516	LDW-C8-S	gamma-BHC Endosulfan I 4,4'-DDD Endrin aldehyde	73 77 51 58	J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406516	LDW-C5-S	Endosulfan I	43	J (all detects)	A
K2406516	LDW-C3-S1	beta-BHC 4,4'-DDE Methoxychlor	61 75 76	J (all detects) J (all detects) J (all detects)	A
K2406516	LDW-C2-S1	gamma-Chlordane 4,4'-DDE	46 88	J (all detects) J (all detects)	A
K2406516	LDW-C1-S	gamma-Chlordane	69	J (all detects)	A
K2406516	LDW-C10-S1DL	2,4-DDD	43	J (all detects)	A
K2406516	LDW-C7-S1DL	gamma-BHC Endosulfan I Endrin aldehyde	200 63 5	J (all detects) J (all detects) J (all detects)	A
K2406516	LDW-C8-SDL	gamma-BHC Endosulfan I 4,4'-DDD Endrin aldehyde	60 78 68 78	J (all detects) J (all detects) J (all detects) J (all detects)	A
K2406170	LDW-B2a-S**	4,4'-DDD	49	J (all detects)	A

*Indicates change as the result of report review.

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2406170	LDW-B6a-S**	alpha-Chlordane 4,4'-DDE	84 79	J (all detects) J (all detects)	A
K2406170	LDW-B4a-S**	4,4'-DDE	86	J (all detects)	A
K2406170	LDW-B1a-S**	2,4'-DDT	51	J (all detects)	A
K2406226	LDW-B7b-S	4,4'-DDT	67	J (all detects)	A
K2406296	LDW-B6b-S	4,4'-DDD Endrin ketone	50 136	J (all detects) J (all detects)	A
K2406296	LDW-B10b-S	4,4'-DDT	55	J (all detects)	A
K2406519	LDW-B9a-S	Hexachlorobenzene Endrin ketone 2,4'-DDT	56 81 69	J (all detects) J (all detects) J (all detects)	A
K2406519	LDW-B3a-S	4,4'-DDE 4,4'-DDD	95 53	J (all detects) J (all detects)	A
K2406580	LDW-B7a-S	4,4'-DDE	91	J (all detects)	A
K2406580	LDW-B7a-SDL	4,4'-DDE	105	J (all detects)	A
K2407012	LDW-B5a-S	gamma-Chlordane Endosulfan II	50 63	J (all detects) J (all detects)	A
K2407012	LDW-B10a-S	2,4'-DDD 2.4'-DDT	62 58	J (all detects) J (all detects)	A
K2407473	LDW-B5a-S	gamma-BHC Endrin Endosulfan II 2,4'-DDE	83 43 88 55	J (all detects) J (all detects) J (all detects) J (all detects)	A
K2407595	LDW-B1b-S	Endrin ketone	91	J (all detects)	A
K2407595	LDW-B2b-S	gamma-Chlordane 4,4'-DDE	43 90	J (all detects) J (all detects)	A
K2407595	LDW-B4b-S	4,4'-DDT	92	J (all detects)	A
K2407595	LDW-B5b-S	Heptachlor epoxide 4,4'-DDE 2,4'-DDD Mirex	88 63 66 72	J (all detects) J (all detects) J (all detects) J (all detects)	A

Compound quantitation and CRQLs data were not reviewed for Level II.

XIII. Overall Assessment of Data

The overall assessment of data was acceptable. In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Associated SDG	Sample	Compound	Flag	A or P
K2406516	LDW-C10-S2	2,4'-DDD	R	A
K2406516	LDW-C10-S2DL LDW-C10-S1DL	All TCL compounds except 2,4'-DDD	R	A
K2406516	LDW-C10-S1	2,4'-DDD 4,4'-DDT	R R	A
K2406516	LDW-C10-S1DL2	All TCL compounds except 4,4'-DDT	R	A
K2406516	LDW-C7-S1	gamma-BHC gamma-Chlordane Endosulfan I Endrin 4,4'-DDD Endrin aldehyde 4,4'-DDT 2,4'-DDT	R R R R R R R R	A
K2406516	LDW-C7-S1DL	All TCL compounds except gamma-BHC gamma-Chlordane Endosulfan I Endrin 4,4'-DDD Endrin aldehyde 4,4'-DDT 2,4'-DDT	R	A
K2406516	LDW-C8-S	gamma-Chlordane 4,4'-DDT 2,4'-DDT delta-BHC gamma-BHC Endosulfan I 4,4'-DDD Endrin aldehyde	R R R R R R R R	A
K2406516	LDW-C8-SDL	All TCL compounds except gamma-Chlordane 4,4'-DDT 2,4'-DDT delta-BHC gamma-BHC Endosulfan I 4,4'-DDD Endrin aldehyde	R	A

Associated SDG	Sample	Compound	Flag	A or P
K2406580	LDW-B7a-S	Hexachlorobenzene gamma-Chlordane 4,4'-DDE 4,4'-DDD Endosulfan sulfate 4,4'-DDT Endrin ketone Toxaphene 2,4'-DDE 2,4'DDT	R R R R R R R R R R	A
K2406580	LDW-B7a-SDL	All TCL compounds except Hexachlorobenzene gamma-Chlordane 4,4'-DDE 4,4'-DDD Endosulfan sulfate 4,4'-DDT Endrin ketone Toxaphene 2,4'-DDE 2,4'DDT	R	A
K2407012	LDW-B8a-S	2,4'-DDD alpha-BHC 4,4'-DDE 4,4'-DDT	R R R R	A
K2407012	LDW-B8a-SDL	All TCL compounds except 2,4'-DDD alpha-BHC 4,4'-DDE 4,4'-DDT	R	A

Data flags are summarized at the end of this report.

*XIV. Field Duplicates

No field duplicates were identified in these SDGs.

XV. Field Blanks

No field blanks were identified in these SDGs.

Polychlorinated Biphenyls by EPA SW 846 Method 8082

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406170	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory, however the laboratory indicated that the samples were then immediately stored frozen.

II. GC/ECD Instrument Performance Check

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

Instrument performance check data were not reviewed for Level II.

III. Initial Calibration

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

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

Retention time windows were evaluated and considered technically acceptable.

Initial calibration data were not reviewed for Level II.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

The percent difference (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

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

Retention times (RT) of all compounds in the calibration standards were within QC limits.

Continuing calibration data were not reviewed for Level II.

V. Blanks

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

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

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

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

Associated SDG	DUP ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
K2407012	LDW-B5a-SDUP (LDW-B5a-S)	Aroclor-1260	51 (≤50)	J (all detects)	A

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Although florisil cleanup was not required by the method, it was performed by the laboratory for EPA Level IV.

Florisil cartridge check data were not reviewed for Level II.

b. GPC Calibration

Although GPC cleanup was not required by the method, GPC cleanup was performed by the laboratory for EPA Level IV.

Although sulfuric acid cleanup was not required by the method, sulfuric acid cleanup was performed by the laboratory for EPA Level IV.

Although mercury cleanup was not required by the method, mercury cleanup was performed by the laboratory for EPA Level IV for samples LDW-B2a-S**, LDW-B6a-S**, LDW-B4a-S**, and LDW-B9b-S** in SDG K2406170.

GPC cleanup data were not reviewed for Level II.

XI. Target Compound Identification

All target compound identifications were within validation criteria.

Target compound identifications data were not reviewed for Level II.

XII. Compound Quantitation and Reported CRQLs

The sample results for detected compounds from the two columns were within 40.0% relative percent differences (RPD) with the following exceptions:

Associated SDG	Sample	Compound	%RPD	Flag	A or P
K2406516	LDW-C7-S2	Aroclor-1260	42	J (all detects)	A
K2406516	LDW-C3-S1	Aroclor-1260	44	J (all detects)	A
K2406296	LDW-B8b-S	Aroclor-1242	49	J (all detects)	A
K2406296	LDW-B10b-S	Aroclor-1260	42	J (all detects)	A
K2407012	LDW-B5a-S	Aroclor-1260	42	J (all detects)	A
K2407012	LDW-B8a-S	Aroclor-1254	44	J (all detects)	A

Compound quantitation and CRQLs data were not reviewed for Level II.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

***XIV. Field Duplicates**

No field duplicates were identified in these SDGs.

XV. Field Blanks

No field blanks were identified in these SDGs.

Metals by EPA SW 846 Methods 6010B/6020/7471A

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

Calibration data were not reviewed for Level II.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

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

Associated SDG	Method Blank ID	Analyte	Maximum Concentration	Associated Samples
K2406516	PB (prep blank)	Lead	0.15 mg/Kg	LDW-C4-S LDW-C10-S2 LDW-C10-S1 LDW-C6-S LDW-C9-S LDW-C7-S1 LDW-C3-S2 LDW-C7-S2 LDW-C8-S LDW-C5-S LDW-C3-S1 LDW-C2-S1 LDW-C2-S2 LDW-C1-S
K2406170	ICB	Silver Thallium Molybdenum	0.014 ug/L 0.016 ug/L 0.069 ug/L	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S**
K2406170	CCB	Silver Thallium Molybdenum	0.02 ug/L 0.008 ug/L 0.026 ug/L	LDW-B2a-S**

*Indicates change as the result of report review.

Associated SDG	Method Blank ID	Analyte	Maximum Concentration	Associated Samples
K2406170	CCB	Arsenic Lead Silver Thallium Molybdenum	0.13 ug/L 0.09 ug/L 0.023 ug/L 0.008 ug/L 0.057 ug/L	LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S**

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

Associated SDG	Sample	Analyte	Reported Concentration	Modified Final Concentration
K2406170	LDW-B1a-S**	Thallium Silver	0.032 mg/Kg 0.046 mg/Kg	0.032U mg/Kg 0.046U mg/Kg

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met in SDG K2406170.

The criteria for analysis were met in SDG K2406170.

ICP Interference check sample analysis data were not reviewed for Level II.

V. Matrix Spike Analysis

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

Associated SDG	Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
K2406516	LDW-C3-S2MS (LDW-C4-S LDW-C10-S2 LDW-C10-S1 LDW-C6-S LDW-C9-S LDW-C7-S1 LDW-C3-S2 LDW-C7-S2 LDW-C8-S LDW-C5-S LDW-C3-S1 LDW-C2-S1 LDW-C2-S2 LDW-C1-S)	Antimony	52 (70-130)	J (all detects) UJ (all non detects)	A

Associated SDG	Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
K2406516	LDW-C3-S2MS (LDW-C4-S LDW-C10-S2 LDW-C10-S1 LDW-C6-S LDW-C9-S LDW-C7-S1 LDW-C3-S2 LDW-C7-S2 LDW-C8-S LDW-C5-S LDW-C3-S1 LDW-C2-S1 LDW-C2-S2 LDW-C1-S)	Zinc	-9 (70-130)	J- (all detects) R (all non-detects)	A
K2406170 K2406226 K2406296 K2406580 K2407012	LDW-B2a-SMS** (LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S** LDW-B7b-S LDW-B3b-S LDW-B6b-S LDW-B8b-S LDW-B10b-S LDW-B7a-S LDW-B8a-S LDW-B10a-S)	Antimony	36 (70-130)	J (all detects) UJ (all non-detects)	A
K2406519	LDW-B9a-SMS (LDW-B9a-S LDW-B3a-S)	Antimony	34 (70-130)	J (all detects) UJ (all non-detects)	A
K2407012	LDW-B8a-SMS (LDW-B8a-S LDW-B10a-S)	Mercury	147 (55-137)	J+ (all detects)	A
K2407473 K2407595	LDW-B5a-SMS (LDW-B5a-S LDW-B1b-S LDW-B2b-S LDW-B4b-S LDW-B5b-S)	Antimony	51 (70-130)	J- (all detects) UJ (all non-detects)	A

Since zinc was detected in all the associated samples, this finding did not warrant rejection (R) of the data.

The laboratory has indicated that there were no matrix spike (MS) analyses specified for Mercury for all samples associated to SDGs K2406170, K2406226, K2406580, and K2407473.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

Associated SDG	DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
K2406516	LDW-C3-S2DUP (LDW-C4-S LDW-C10-S2 LDW-C10-S1 LDW-C6-S LDW-C9-S LDW-C7-S1 LDW-C3-S2 LDW-C7-S2 LDW-C8-S LDW-C5-S LDW-C3-S1 LDW-C2-S1 LDW-C2-S2 LDW-C1-S)	Lead Molybdenum Zinc	31 (≤30) 31 (≤30) 67 (≤30)	- - -	J (all detects) UJ (all non-detects)	A
K2407473 K2407595	LDW-B5a-SDUP (LDW-B5a-S LDW-B1b-S LDW-B2b-S LDW-B4b-S LDW-B5b-S)	Arsenic Molybdenum Silver	34 (≤30) 81 (≤30) 39 (≤30)	- - -	J (all detects) UJ (all non-detects)	A

The laboratory has indicated that there were no duplicate (DUP) analyses specified for Mercury for all samples associated to SDGs K2406170, K2406226, K2406580, and K2407473.

VII. Laboratory Control Samples (LCS)

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

Standard reference material were within QC limits.

VIII. Internal Standards (ICP-MS)

All internal standard areas and retention times were within QC limits in SDG K2406170.

Internal standards data were not reviewed for Level II.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in these SDGs.

*X. ICP Serial Dilution

The ICP serial dilution analyses were reviewed for each matrix as applicable. The analysis criteria were met with the following exceptions:

Associated SDG	Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
K2406170 K2406226 K2406296 K2406580 K2407012	LDW-B2a-S**L	Arsenic Lead	25 (≤10) 13 (≤10)	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S** LDW-B7b-S LDW-B3b-S LDW-B6b-S LDW-B8b-S LDW-B10b-S LDW-B7a-S LDW-B8a-S LDW-B10a-S	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
K2406519	LDW-B9a-SL	Arsenic	23 (≤10)	LDW-B9a-S LDW-B3a-S	J (all detects) UJ (all non-detects)	A
K2407473 K2407595	LDW-B5a-SL	Arsenic	15 (≤10)	LDW-B5a-S LDW-B1b-S LDW-B2b-S LDW-B4b-S LDW-B5b-S	J (all detects) UJ (all non-detects)	A

XI. Sample Result Verification

All sample result verifications met validation criteria.

Sample result verification data were not reviewed for Level II.

XII. Overall Assessment of Data

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

*XIII. Field Duplicates

No field duplicates were identified in these SDGs.

XIV. Field Blanks

No field blanks were identified in these SDGs.

Arsenic by EPA SW 846 Method 6020

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

Calibration data were not reviewed for Level II.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

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

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

ICP Interference check sample analysis data were not reviewed for Level II.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits for SDG K2407469.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits for SDG K2407469.

VII. Laboratory Control Samples (LCS)

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

Standard reference material were within QC limits.

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

ICP-MS data were not reviewed for Level II.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in these SDGs.

X. ICP Serial Dilution

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

XI. Sample Result Verification

All sample result verifications met validation criteria.

Sample result verification data were not reviewed for Level II.

XII. Overall Assessment of Data

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

XIII. Field Duplicates

No field duplicates were identified in these SDGs.

XIV. Field Blanks

No field blanks were identified in these SDGs.

Total Organic Carbon and Particle Size by PSEP Method

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

Initial calibration data were not reviewed for Level II.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

Continuing calibration data were not reviewed for Level II.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the method blanks.

Method blanks were not required for particle size.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

Matrix spike (MS) analyses were not required for particle size.

V. Duplicates/Triplicates

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

VI. Laboratory Control Samples

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

Laboratory control samples were not required for particle size.

VII. Sample Result Verification

All sample result verifications met validation criteria.

Sample result verification data were not reviewed for Level II.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report.

*IX. Field Duplicates

No field duplicates were identified in these SDGs.

X. Field Blanks

No field blanks were identified in these SDGs.

GC Butyltins By Krone Method

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding
K2406170	LDW-B2a-S** LDW-B6a-S** LDW-B4a-S** LDW-B1a-S** LDW-B9b-S**	All TCL compounds	Cooler temperature was reported at 11°C upon receipt by the laboratory, however the laboratory indicated that the samples were then immediately stored frozen.

II. Calibration

a. Initial Calibration

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

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

Retention time windows were evaluated and considered technically acceptable for samples on which EPA Level IV review was performed.

Initial calibration data were not reviewed for Level II.

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 25.0% QC limits.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which EPA Level IV review was performed.

Continuing calibration data were not reviewed for Level II.

III. Blanks

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

IV. Accuracy and Precision Data

a. Surrogate Recovery

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

b. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Associated SDG	Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
K2406516	LDW-C9-SMS/MSD (LDW-C9-S)	n-Butyltin	13 (20-130)	-	-	J (all detects) UJ (all non-detects)	A
K2406170	LDW-B1a-SMS/MSD** (LDW-B1a-S**)	n-Butyltin	4 (20-130)	-	128 (≤50)	J (all detects) UJ (all non-detects)	A
K2406580	LDW-D7a-SMS/MSD (LDW-B7a-S)	n Butyltin	12 (20-130)	-	-	J (all detects) UJ (all non-detects)	A

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

c. Laboratory Control Samples

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

Standard reference material were within QC limits.

No standard reference material was analyzed for Tetra-n-butyltin.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which EPA Level IV review was performed.

Target compound identifications data were not reviewed for Level II.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Associated SDG	Sample	Compound	Finding	Criteria	Flag	A or P
K2406226	LDW-B3b-S	Tri-n-butyltin Di-n-butyltin n-Butyltin	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A
K2407595	LDW-B1b-S	Tri-n-butyltin Di-n-butyltin	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A
K2407595	LDW-B1b-SDL	Tri-n-butyltin	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Compound quantitation and CRQLs data were not reviewed for Level II.

VII. System Performance

The system performance was acceptable.

System performance data were not reviewed for Level II.

VIII. Overall Assessment of Data

The overall assessment of data was acceptable. In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Associated SDG	Sample	Compound	Flag	A or P
K2406226	LDW-B3b-S	All TCL compounds	R	A
K2407595	LDW-B1b-S	Tri-n-butyltin Di-n-butyltin n-Butyltin	R R R	A

*Indicates change as the result of report review.

Associated SDG	Sample	Compound	Flag	A or P
K2407595	LDW-B1b-SDL	Tetra-n-butyltin	R	A

Data flags are summarized at the end of this report.

***IX. Field Duplicates**

No field duplicates were identified in these SDGs.

X. Field Blanks

No field blanks were identified in these SDGs.

LDC #: 12631A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406516 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 - 27/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	Not reviewed for Level II validation.
IV.	Continuing calibration	N	Not reviewed for Level II validation.
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates MS/MSD	A/SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	Not reviewed for Level II validation.
XII.	Compound quantitation/CRQLs	N	Not reviewed for Level II validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level II validation.
XIV.	System performance	N	Not reviewed for Level II validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW N	D-2+3 -12+13, 6+8, 7+11, 8
XVII.	Field blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

MS+MSD

1	LDW-C4-S	11	LDW-C3-S1	21	KWG0413228-5	31	
2	LDW-C10-S2	12	LDW-C2-S1	22		32	
3	LDW-C10-S1	13	LDW-C2-S2	23		33	
4	LDW-C6-S	14	LDW-C1-S	24		34	
5	LDW-C9-S	15	LDW-C5-SMS	25		35	
6	LDW-C7-S1	16	LDW-C5-SMSD	26		36	
7	LDW-C3-S2	17	LDW-C5-SDUP	27		37	
8	LDW-C7-S2	18		28		38	
9	LDW-C8-S	19		29		39	
10	LDW-C5-S	20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: P63A29
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer:
2nd Reviewer:

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

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	PHL	136 (40-130)	No qual
				( )	
		2	FBP	28 ( )	
				( )	
		3	PHL	132 ( )	
				( )	
		4	FBP	38 ( )	
				( )	
		11	FBP	31 ( )	
				( )	
		13	FBP	30 ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory

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

SUR.2S

LDC #: 12631A29
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: R

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		10/11	A (~~<LOD~~)	( )	( )	53 (≤ 50)	10 (2x)	No Qual
			TT	( )	( )	NC ( )		
			XX	( )	( )	NC ( )		
			~~AA~~	( )	( )	NC ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 17631A29
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

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

(Y) N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LWF0413228-3/-4	O	30 (40-130)	24 (40-130)	( )	M+BK	J/UJ/P
			PPP	( )	39 ( )	( )		↓
			3SS*	0* ( )	0 ( )	~~108 (SSD)~~ R		J/R/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
			~~* %R for LCS~~	( )	~~0.4 (%RSD)~~	( )		
				( )	( )	( )		
				( )	( )	( )		
		* 0.4 %	~~for LCS (and)~~	( )	~~0.13 % for LCSD~~ R	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		No SRM	M	( )	( )	( )	M + BK	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12691A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/2/04
SDG #: K2406170 Level ~~II~~ IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/11 - 15/04 Temp @ 11°C
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	~~A~~	%RSD. r^2
IV.	Continuing calibration	~~A~~ N	%D. ICV
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates /DUP	SW	
VIII.	Laboratory control samples	SW	LCS/D.
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	~~A~~	
XII.	Compound quantitation/CRQLs	~~A~~	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	~~A~~	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B2a-S sed	11	KWG0404281-5	21		31	
2	LDW-B6a-S	12		22		32	
3	LDW-B4a-S	13		23		33	
4	LDW-B1a-S	14		24		34	
5	LDW-B9b-S	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12691A29
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	✓			
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			ICV
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Surrogate spikes				
Were all surrogate %R within QC limits?		✓		
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			DUP
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12691A2a
SDG #: K2406170
METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: DC

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	9/26/04	0926F012 (ICV)	X	26		All + Blk	J/UJ/A

CONCAL.2S

LDC #: 1691A2a
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: a
2nd Reviewer: SK

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/20/04 **Blank analysis date:** 9/28/04
Conc. units: ug/kg Associated Samples: ALL

Compound	Blank ID	Sample Identification								
LMW	041428I-5	1	2 (2x)	3 (2x)	4	5				
A	3.2	(34)	3/60U	23/60U	(78)	(92)				
BNA	3.0	(53)	(61)	(140)	15/200U	(69)				

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: [illegible]
SDG #: K2406170
METHOD: GC/MS BNA (EPA SW 846 Method 8270)

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	FBP	26 (40-130)	No Qual
				( )	
		5	FBP	33 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory

	QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116
S3 (TPH) = Terphenyl-d14	18-137	33-141
S4 (PHL) = Phenol-d5	24-113	10-94

	QC Limits (Soil)	QC Limits (Water)
S5 (2FP)= 2-Fluorophenol	25-121	21-100
S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

SUR.2S

LDC #: 12691A29
SDG #: k2406170

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		k2406093-001	E	28 (40-130)	28 (40-130)	( )	None	No Qual
				( )	( )	( )		
		k2406093-001	BB	(< 5x RL)	( )	66 (≤ 50)	None	No Qual
			XX	↓)	( )	70 (↓)		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorcbenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 12691A29
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414281-3/	O	30 (40-130)	39 (40-130)	( )	All+Bk	J/UJ/P
		-4	SSS	0 (↓)	0 (↓)	( )		J/R/P
				( )	( )	( )		
				( )	( )	( )		
		No SRM		( )	( )	( )	All+Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 1369A29
SDG #: K2406IT0

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
$\%RSD = 100 * (S/X)$

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1000 std)	Recalculated RRF (1000 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	1GAC	9/26/04	Phenol (1st internal standard)	2.12	2.12	2.01	2.01	16.5	16.5
			~~Naphthalene~~ (2nd internal standard)	0.307	0.307	0.300	0.300	3.5	3.4
			~~Fluorene~~ (3rd internal standard)	1.27	1.27	1.16	1.16	T.T	T.T
			Pentachlorophenol (4th internal standard)	~~0.124~~ 0.162	0.162	0.167	0.167	4.1	4.1
			Bis(2-ethylhexyl)phthalate (5th internal standard)	1.02	1.02	0.987	0.987	14.5	14.5
			~~Benzo(a)pyrene~~ (6th internal standard)	1.92	1.92	1.95	1.95	CUNR	15.4
2			Phenol (1st internal standard)						
			Naphthalene (2rd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

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

LDC #: 12691A29
SDG#: K240617D

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 4
2nd Reviewer: SK

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

Parameter: Di-n-octyl Phthalate

Order of regression: linear

DATE	GCMS ID	COLUMN	(Y) AREA RATIO	(X) CONC RATIO	(X^2) CONC RATIO
09/26/2004	MS06	CAP	0.27720	0.20	0.04
			0.86326	0.50	0.25
			1.91755	1.00	1.00
			4.25891	2.00	4.00
			6.42643	3.00	9.00
			8.67358	4.00	16.00
			10.982758	5.00	25.00

Regression Output:

Constant		-0.2444
Std Err of Y Est		0.0572
R Squared		0.9998369
No. of Observations		7
Degrees of Freedom		5
X Coefficient (s)	2.2363	0.0015
Std Err of Coef.	0.0128	0.0007
Correlation Coefficient (r) =		0.9999184
Coefficient of Determination (r^2) =		0.9998369

LDC #: 12691A29
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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

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

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	0928F001	9/28/14	Phenol (1st internal standard)	2.01	1.75	1.75	13	13
			~~Naphthalene~~ (2nd internal standard)	0.300	0.316	0.316	5	5
			~~Fluorene~~ (3rd internal standard)	1.16	1.32	1.32	14	14
			Pentachlorophenol (4th internal standard)	0.167	0.178	0.178	7	7
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.987	1.19	1.19	20	20
			~~Benzo(a)pyrene~~ (6th internal standard)	2000	2200	2200	11	11
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

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

LDC #: 12691A29
SDG #: 240610

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: a
2nd reviewer: a

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

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	2500	1228	49	49	0
2-Fluorobiphenyl	↓	647.72	26	26	
Terphenyl-d14	↓	1807	72	72	
Phenol-d5	3750	2167	58	58	
2-Fluorophenol	↓	2038	54	54	
2,4,6-Tribromophenol	↓	3024	81	81	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

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

Sample ID: _____

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

LDC #: 12691A29
SDG #: K2406170

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

Reviewer: CA
2nd Reviewer: AR

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

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

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: KWG0414281-3/-4

Compound	Spike Added (MB5)		Spike Concentration (MB4)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol	250	250	188	212	75	75	85	85	12	12
2-Chlorophenol	↓	↓	184	215	74	74	86	86	15	15
1,4-Dichlorobenzene	↓	↓	177	222	71	71	89	89	23	23
N-Nitroso-di-n-propylamine	↓	↓	176	189	70	70	76	76	7	7
1,2,4-Trichlorobenzene	↓	↓	193	238	77	77	95	95	21	21
4-Chloro-3-methylphenol	↓	↓	179	232	72	72	93	93	26	26
~~Acenaphthene~~										
4-Nitrophenol	250	250	243	267	97	97	107	107	10	9
2,4-Dinitrotoluene	↓	↓	258	286	103	103	114	114	10	10
Pentachlorophenol	↓	↓	207	224	83	83	89	89	8	8
~~Pyrene~~										

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

LDC #: 12691A29
SDG #: K2406IT0

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CQ
2nd reviewer: CQ

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

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1 , A :

$$\text{Conc.} = \frac{(48830)(1000)(2)(1)(\quad)}{(70982)(2.01)(40.0)(1)(0.50)}$$

$$= 34.2\ \mu g/kg$$

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

RECALC.2S

LDC #: 12691B2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406226 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: 2q

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

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

	Validation Area		Comments (cooler temp)
I.	Technical holding times	A	Sampling dates: 8/10 - 13/04 (7.8°C)
II.	GC/MS Instrument performance check	N	Not reviewed for level II
III.	Initial calibration	N	↓
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates /DUP	SW/SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level II
XI.	Target compound identification	N	↓
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	↓
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B7b-S (sed)	11		21		31	
2	LDW-B3b-S (↓)	12		22		32	
3	KWG0414281-5	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12691B29
SDG #: k2406=26

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: SK

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/22/04 **Blank analysis date:** 9/28/04
Conc. units: ug/kg Associated Samples: all

Compound	Blank ID	Sample Identification								
~~Analyte~~	414-28-5	1 (2x)	2 (5x)							
3 A	3.2	10/600 U	52/1500 U							
EEC	3.0	(65)	(260)							

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12691B29
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET

Surrogate Recovery

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	FBP	83 (40-130)	No qual
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory

	QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116
S3 (TPH) = Terphenyl-d14	18-137	33-141
S4 (PHL) = Phenol-d5	24-113	10-94

	QC Limits (Soil)	QC Limits (Water)
S5 (2FP) = 2-Fluorophenol	25-121	21-100
S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

SUR.2S

LDC #: 12691B29
SDG #: K2406236

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		K2406093-001	E	28 (40-130)	28 (40-130)	( )	None	No Qual
				( )	( )	( )		
		K2406093-001	QQ	( )	( )	66 (≤50)	None	No Qual
			XX	( )	( )	70 ( )		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 36918 2a
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: a
2nd Reviewer: a

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414281-3/	O	30 (40-130)	39 (40-130)	( )	All + Blk	J/UJ/P
		-4	SSS	0 (↓)	0 (↓)	( )		J/R/P
				( )	( )	( )		
				( )	( )	( )		
		No SRM	All	( )	( )	( )	All + Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12691C2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/20/04
SDG #: K2406296 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18-19/04
II.	GC/MS Instrument performance check	N	Not reviewed for Level II
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates MS/MSD	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for Level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B6b-S sed	11	KWF041428 1-5	21		31	
2	LDW-B8b-S	12		22		32	
3	LDW-B10b-S	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 1291C29
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9
2nd Reviewer: a

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/22/04 **Blank analysis date:** 9/29/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
	MB1 041428I-S	1	2	3						
5 A	3.2	(35	T.3/32U	10/30U						
EEE	3.0	160)	(60)	(35)						

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12691c29
SDG #: k2406296

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 9

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

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	FBP	37 (40-130)	No qual
				( )	
		2	NBZ	38 ( )	J/UJ/P see tables
			FBP	25 ( )	
				( )	
		3	NBZ	28 ( )	J/UJ/P
			FBP	31 ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

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

LDC #: 12691c29
SDG #: k2406246

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 0

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		k2406093-001	E	28 (40-130)	28 (40-130)	( )	None	No Qual
				( )	( )	( )		
				( )	( )	( )		
		k2406093-001	QQ	( )	( )	66 (≤50)	None	No Qual
			XX	( )	( )	70 ( )		✓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 12691C29
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414281-3/	O	30 (40-130)	39 (40-130)	( )	All + Bk	J/UJ/P
		-4	SSS	0 (↓)	0 (↓)	( )		J/R/P
				( )	( )	( )		
				( )	( )	( )		
		No SRM	M	( )	( )	( )	M + Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12691D2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/06
SDG #: K2406519 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26-27/06
II.	GC/MS Instrument performance check	N	Not reviewed for Level III
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates /DUP	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for Level III
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B9a-S sed	11	KWF41428-5	21		31	
2	LDW-B3a-S ✓	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12691D2A
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Blanks

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

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/22/04 **Blank analysis date:** 9/29/04
Conc. units: _____ Associated Samples: ALL

Compound	Blank ID	Sample Identification								
LMF041428I-5		1(2X)	2(2X)							
A	3.2	(27)	(220)							
EEE	3.0	(210)	67							

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 27910Z9
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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

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

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	NBZ	34 (40-130)	No qual.
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

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

SUR.2S

LDC #: K2691D2A
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: SK
2nd Reviewer: DR

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		K2406093-001	E	28 (40-130)	28 (40-130)	( )	None	No Qual
				( )	( )	( )		
		K2406093-001	QQ	( )	( )	66 (≤50)	None	No Qual
			XX	( )	( )	70 (V)		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 13691D2a
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: d
2nd Reviewer: dr

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

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

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KW~~4~~0414281-3/	O	30 (40-130)	39 (40-130)	( )	All+Bk	J/UJ/P
		-4	SSS	0 (↓)	0 (↓)	( )		J/R/P
				( )	( )	( )		
				( )	( )	( )		
		No SRM	M	( )	( )	( )	M+Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12691E2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/06
SDG #: K2406580 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
II.	GC/MS Instrument performance check	N	Not ~~reported~~ reviewed for Level III
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates/Dup	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for Level III
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B7a-S Sed	11		21		31	
2	KNG41428I-5	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12491B29
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Blanks

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

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/22/04 **Blank analysis date:** 9/29/04
Conc. units: ug/kg Associated Samples: MM

Compound	Blank ID	Sample Identification								
LMG041428-5		1 (2x)								
A	03.2	13/60U								
ZZZ	3.0	63								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12691E29
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: A
2nd Reviewer: Q

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		K2406093-001	E	28 (40-130)	28 (40-130)	( )	None	No Qual
				( )	( )	( )		
		K2406093-001	QQ	( )	( )	66 (≤50)	None	No Qual
			XX	( )	( )	70 (V)		V
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 13691E29
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

(Y) N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414281-3/	O	30 (40-130)	39 (40-130)	( )	M+Bk	J/UJ/P
		-4	SSS	0 (↓)	0 (↓)	( )		J/R/P
				( )	( )	( )		
				( )	( )	( )		
		No MS/SRM	M	( )	( )	( )	M+Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LCSLCSD.2S

LDC #: 12691F2a **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2407012 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: CA
2nd Reviewer: DA

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17-25/04
II.	GC/MS Instrument performance check	N	Not reviewed for level II
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B8a-S sed	11	KWG041428/-	21		31	
2	LDW-B10a-S	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12691E29
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: a
2nd Reviewer: DE

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

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

(Y) N N/A Was a method blank analyzed for each matrix?
(Y) N N/A Was a method blank analyzed for each concentration preparation level?
(Y) N N/A Was a method blank associated with every sample?
(Y) N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/23/04 **Blank analysis date:** 9/29/04
Conc. units: ug/kg Associated Samples: all

Compound	Blank ID	Sample Identification								
KWF041428I	5	1(5)	2(2)							
A	3.2	2800	1100							
EE	3.0	190	39/400 U							

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

BNA_blank.wpd

LDC #: 13691F2A
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		K2406093-001	E	28 (40-130)	28 (40-130)	( )	None	No Qual
				( )	( )	( )		
		K2406093-001	QQ	( )	( )	66 (≤50)	None	No Qual
			XX	( )	( )	70 (V)		↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 1269 1F29
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

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

(Y) N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0414281-3/	O	30 (40-130)	39 (40-130)	( )	All + BLK	J/UJ/P
		-4	SSS	0 (↓)	0 (↓)	( )		J/R/P
				( )	( )	( )		
				( )	( )	( )		
		No SRM	All	( )	( )	( )	All + BLK	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

LDC #: 12734B2a **VALIDATION COMPLETENESS WORKSHEET** Date: 4/15/04
SDG #: K2407473 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: Q
2nd Reviewer: SW

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates MS/MSD	SW/SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B5a-S Sed	11		21		31	
2	KWG0415420-5	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

BNs

LDC #: 12734B29
SDG #: K2407477

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: CA
2nd Reviewer: RC

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/8/04 **Blank analysis date:** 10/12/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
~~HMX~~	041520-5	1								
A	2.4	(24)								
CCC	2.2	(52)								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #:

SDG #: K24074T3

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: 9
2nd Reviewer: K

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

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

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?

Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?

Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	2FP	37 (40-130)	No Qual
			NBZ	31 (↓)	J/UJ/P (see table)
			FBP	24 (↓)	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

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

SUR.2S

LDC #: 12734B2a
SDG #: K2407413

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: a
2nd Reviewer: M

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B5b-S	X	( )	( )	( )		
				( )	( )	( )		
		LDW-B2b-S	E	( )	38 (40-130)	( )	None	No Qual
		(K2407595)		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		LDW-B2b-S DUP	CC	(<5x of RC)	( )	NC (≤ 50)	None	No Qual
		(K2407595)	WW	( )	( )	67 ( )		
			AAA	(✓)	( )	105 ( )		✓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 12154B24
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 2

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

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

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0415420-3/4	NNN	25 (40-130)	15 (40-130)	( )	MI+BK	J/NJ/P
			O	( )	29 ( )	60 (<50)		
			T	( )	38 ( )	( )		
			X	31 ( )	33 ( )	( )		
			SSS	0 ( )	0 ( )	( )		J/R/P
				( )	( )	( )		
				( )	( )	( )		
		No SRM	M	( )	( )	( )	MI+BK	Tox +
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12734C2a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407595 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: SC

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27-28/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates /DUP	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples

1	LDW-B1b-S	11	KWF0415-5	21		31	
2	LDW-B2b-S	12		22		32	
3	LDW-B4b-S	13		23		33	
4	LDW-B5b-S	14		24		34	
5	LDW-B2b-SMS	15		25		35	
6	LDW-B2b-SMSD	16		26		36	
7	LDW-B2b-SDUP	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlcrobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12734C29
SDG #: K240T595

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 8

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/8/04 **Blank analysis date:** 10/12/04
Conc. units: ug/g Associated Samples: All

Compound	Blank ID	Sample Identification								
~~1,4-Dioxane~~	41520-	5	1	2	3	4				
4	2.4	(19)	(48)		11/30U					
EEE	2.3	(28)	(150)	(140)	(110)					

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: [illegible]

SDG #: KB407595

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 6 of [illegible]
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?

Y (N) N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?

Y N (N/A) If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		2	FBP	35 (40-130)	No Anal
				( )	
		3	NBZ	39 ( )	J/UJ/P (BNs. see "B")
			FBP	28 ( )	
				( )	
		4	FBP	38 ( )	No Anal.
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

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

SUR.2S

LDC #: 12T3429
SDG #: K2407595

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		05/6	C	( )	38 (40-130)	( )	2	J/UJ/A
				( )	( )	NC ( )		
		2/7	CC	(<5x of SR)	( )	NC (<5)	2	No qual
			WW	( )	( )	67 ( )		
			AAA	( )	( )	106 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 10134C29
SDG #: K2407595

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: Q
2nd Reviewer: JC

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

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

(Y) N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KNG0415420-3/-4	NNN	25 (40-130)	15 (40-130)	( )	M+Blk	J/UJ/P
			O	( )	29 ( )	60 (≤50)		
			T	( )	38 ( )	( )		
			X	31 ( )	33 ( )	( )		
			SSS	0 ( )	0 ( )	( )		J/R/P
				( )	( )	( )		
				( )	( )	( )		
		NoSRM	M	( )	( )	( )	M+Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12631A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406516 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: A
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 - 27/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	Not reviewed for Level II validation.
IV.	Continuing calibration	N	Not reviewed for Level II validation.
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	A SW	
VIII.	Laboratory control samples	A SW	LCS/D, SRM
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	Not reviewed for Level II validation.
XII.	Compound quantitation/CRQLs	SW N	Not reviewed for Level II validation.
XIII.	Tentitatively identified compounds (TICs)	N	Not reviewed for Level II validation.
XIV.	System performance	N	Not reviewed for Level II validation.
XV.	Overall assessment of data	SW N	
XVI.	Field duplicates	SW N	~~D=2+3~~ D=3+14, 2+3, 6+8, 7+12 SR
XVII.	Field blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

All soils

1	LDW-C4-S	11	LDW-C5-S	21	~~HWG413012-5~~	31	
2	LDW-C10-S2	12	LDW-C3-S1	22		32	
3	LDW-C10-S1	13	LDW-C2-S1	23		33	
4	LDW-C6-S	14	LDW-C2-S2	24		34	
5	LDW-C9-S	15	LDW-C1-S	25		35	
6	LDW-C7-S1	16	LDW-C1-SMS	26		36	
7	LDW-C3-S2	17	LDW-C1-SMSD	27		37	
8	LDW-C7-S2	18	LDW-C1-SDUP	28		38	
9	LDW-C8-S	19		29		39	
10	LDW-C8-SDL	20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12631A2b
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: a
2nd Reviewer: R

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/1/04 **Blank analysis date:** 9/10/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
[illegible]	241302-S	11								
S	0.51	75X								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12631A-2b
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: R

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-C1-3 DUP	S (SVR)	( )	( )	58 (≤ 57)	15	No Qual.
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #:
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S.W.	DD. JJ. GG)	NN, VV. KK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12631A26
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		9	UU, YY, ZZ, GGG, HHH	9	dets/A
			CCC, DDD, III, JJJ, KKK		
			>calib range		

Comments: See sample calculation verification worksheet for recalculations

COMQUA.2S

LDC #: 12631A36
SDG #: E240651G

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: 9
2nd Reviewer: SR

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

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

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		9	UU. YY. ZZ. ~~FFF~~ HHH. ~~KKK~~. CCC	9	R/A
			DDD. III. JJJ. LLL		
		10	All except above	10	↓

Comments: _____

LDC #: 12691A2b

SDG #: K2406170

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 11/2/04

Page: 1 of 1

Reviewer: Q

2nd Reviewer: K

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

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

	Validation Area		Comments cooler temp
I.	Technical holding times	A	Sampling dates: 8/11-15/04 11°C
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	7oD & ICV
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates MS/MSD	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	SW	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	A	
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

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

Validated Samples:

All soils

1	LDW-B2a-S	11	KWF0414432-7	21		31	
2	LDW-B6a-S	12		22		32	
3	LDW-B4a-S	13		23		33	
4	LDW-B4a-SDL	14		24		34	
5	LDW-B1a-S	15		25		35	
6	LDW-B9b-S	16		26		36	
7	LDW-B1a-SMS	17		27		37	
8	LDW-B1a-SMSD	18		28		38	
9	LDW-B1a-SDUP	19		29		39	
10		20		30		40	

LDC #: 1269A26
SDG #: 240610

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: 9
2nd Reviewer: K

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		✓		
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.			✓	
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.			✓	
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1-Methylnaphthalene
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Dibenzothiophene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 1269 (A-b)
SDG #: K240617D

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: a
2nd Reviewer: DR

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

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

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/22/04 **Blank analysis date:** 9/27/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
THF	44432-T	All								
S	0.59	>5X								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12691A#b
SDG #: K2406ITO

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 6 of 1
Reviewer: 4
2nd Reviewer: 4

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		40W-B1a-S	C3-S	(< 5x RL)	( )	41 (≤ 50)	~~None~~ S	No Qual
		(K2406ITO)	C4-S	( )	( )	98 ( )		
			C2-NN	( )	( )	5 ( )		
			C3-NN	( )	( )	83 ( )		
			C1-WWS	( )	( )	75 ( )		
			C3-WWS	( )	( )	NC ( )		✓
			C1-WW/W	( )	( )	57 ( )		1 dets / A
			C2-WW/W	( )	( )	6 ( )		
			C3-WW/W	( )	( )	88 ( )		
			C4-DDD	(< 5x RL)	( )	5 (✓)		✓ No Qual.
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

MSD as

LDC #: 13691A2b
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
[✓ Y] N N/A Was a LCS required?
[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S, W,	DD, JJ, GG)	NN, VV, KKK	( )	All + Blk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		

LDC #: 27618A2D
SDG #: k2406170

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: DL

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

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

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

Y (N) N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		3	UU. YY. ZZ. CI-YY^S/ZZ^S	3	√dets / D
			DDD >calib range		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691A2b
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		3	UU. YY. ZZ. C1-YY^S/ZZ^S	3	R/A
			DDT		
					↓
		4	All except above	4	

Comments: _____

OVR.2S

LDC #: 1269A2h
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1000 std)	Recalculated RRF (1000 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/24/04	Phenol (1st internal standard)						
			Naphthalene (2rd internal standard)	1.17	1.17	1.25	1.25	12.7	12.6
			Fluorene (3rd internal standard)	1.51	1.51	1.55	1.55	5.0	5.1
			~~Pentachlorophenol~~ (4th internal standard)	1.31	1.31	1.37	1.37	6.9	6.7
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard)	1.68	1.68	1.78	1.78	8.9	9.0
			Benzo(a)pyrene (6th internal standard)	1.49	1.49	1.48	1.48	2.9	2.8
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pertachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691A2b
SDG #: K2406iT0

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	092T002	9/27/04	Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)	1.25	1.18	1.18	6	6
			Fluorene (3rd internal standard)	1.55	1.54	1.54	1	1
			~~Pentachlorophenol~~ NA (4th internal standard)	1.37	1.34	1.34	2	2
			~~Bis(2-ethylhexyl)phthalate~~ 35 (5th internal standard)	1.78	1.71	1.71	4	4
			Benzo(a)pyrene (6th internal standard)	1.48	1.41	1.41	5	5
2	092TF032	9/27/04	Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)	1.25	1.18	1.18	6	6
			Fluorene (3rd internal standard)	1.55	1.55	1.55	1	1
			~~Pentachlorophenol~~ NA (4th internal standard)	1.37	1.33	1.33	3	3
			~~Bis(2-ethylhexyl)phthalate~~ 33 (5th internal standard)	1.78	1.73	1.73	3	3
			Benzo(a)pyrene (6th internal standard)	1.48	1.41	1.41	5	5
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691A2b
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: a
2nd reviewer: DC

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ NN-d10	200	119.28	60	60	0
2-Fluorobiphenyl FY-d10	↓	134.67	67	≈67	↓
Terphenyl-d14 TPH	↓	172.47	86	86	↓
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
~~1,2-Dichlorobenzene-d4~~					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 12691A2h
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: CL
2nd Reviewer: AR

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MS - MSD I * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 7/8

Compound	Spike Added (MB13)		Sample Concentration (MB15)	Spiked Sample Concentration (MB8)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
~~Phenol~~ GG	493	494	11	400	407	79	79	80	80	2	2
2-Chlorophenol 22	V	V	140	546	551	82	82	83	83	1	1
1,4-Dichlorobenzene											
N-Nitroso-di-n-propylamine											
1,2,4-Trichlorobenzene											
4-Chloro-3-methylphenol											
Acenaphthene											
4-Nitrophenol											
2,4-Dinitrotoluene											
Pentachlorophenol											
~~Pyrene~~											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 1-69 1A3b
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 4
2nd Reviewer: AP

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concertration
SA = Spike added

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboratory ccntrol sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: KWG04 14432-3/-4

Compound	Spike Added (µg/kg)		Spike Concentration (µg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
~~Phenol~~ 66	520	500	406	405	81	81	81	81	0	0
2-Chlorophenol 22	↓	↓	434	434	87	87	87	87	0	0
1,4-Dichlorobenzene										
N-Nitroso-di-n-propylamine										
1,2,4-Trichlorobenzene										
4-Chloro-3-methylphenol										
Acenaphthene										
4-Nitrophenol										
2,4-Dinitrotoluene										
Pentachlorophenol										
~~Pyrene~~										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 269KA2b
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: a
2nd reviewer: K

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1 , 5 :

Conc. = $\frac{(31843)(200)(10)(1)(\quad)}{(388577)(1.25)(20.03)(1)(0.50)}$

= 13.1 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

LDC #: 12691B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406226 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 1
2nd Reviewer: 2

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/10 - 13/04 Temp @ 7.8 °C
II.	GC/MS Instrument performance check	N	Not reviewed for Level II
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates / DUP	SW/SW	
VIII.	Laboratory control samples	A/SW	LCS/D, SRM
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for Level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	SW	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	LDW-B7b-S sed	11	LWG0414432-1	21		31	
2	LDW-B3b-S	12		22		32	
3	LDW-B3b-SDL	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1-Methylnaphthalene
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Dibenzothiophene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12691B2b
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/22/04 **Blank analysis date:** 9/27/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
[illegible]	114432-7	All								
S	0.59	75X								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12691B1
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 4
2nd Reviewer: R

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B1a-S	C3-S	( )	( )	141 (≤ 50)	None	No Eval
		(K2406170)	C4-S	( )	( )	98 ( )		
			C2-NN	( )	( )	51 ( )		
			C3-NN	( )	( )	83 ( )		
			C1-WWS	( )	( )	75 ( )		
			C3-WWS	( )	( )	NC ( )		
			C1-WW/W	( )	( )	57 ( )		
			C2-WW/W	( )	( )	61 ( )		
			C3-WW/W	( )	( )	88 ( )		
			C4-DDD	( )	( )	51 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #:
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: q
2nd Reviewer: AR

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S, W,	DD, JJ, GG)	NN, VV, KKK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LCSLCSD.2S

LDC #: 12691B2b
SDG #: k2406226

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: T
2nd Reviewer: CR

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N ~~N/A~~ Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		2	YY. ZZ. CCC. cl-YY/ZZ	2	Vdata/IS
			DDD. cl-DDD >calib		
			range		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691B26
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		2	YY. 22. CCC. cl-YY/22	2	P/D
			DDD. cl-DDD		
					↓
		3	ML except above	3	

Comments: _____

OVR.2S

LDC #: 12691C2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406296 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: dc

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18-19/04
II.	GC/MS Instrument performance check	N	Not reviewed for Level II
III.	Initial calibration	N	↓
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates / DUP	A/SW	LDW-B19-S (K2406170)
VIII.	Laboratory control samples	A/SW	LCS/D, SRM
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for Level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	LDW-B6b-S sed	11	KWG0414432-7	21		31	
2	LDW-B8b-S ↓	12		22		32	
3	LDW-B10b-S	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1-Methylnaphthalene
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Dibenzothiophene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12691C2b
SDG #: K0406296

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 4
2nd Reviewer: BC

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/22/04 **Blank analysis date:** 9/27/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
KWG1414432-7		1	2	3						
S	0.59	(11)	(4.8)	2.5/5.0U						

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: F691C2b
SDG #: K2406296
METHOD: GC/MS BNA (EPA SW 846 Method 8270)

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer:
2nd Reviewer:

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y [✓ N] N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N [✓ N/A] If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N [✓ N/A] If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	NN-d10	37 (40-130)	No Qual
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)		QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114	S5 (2FP)= 2-Fluorophenol	25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S3 (TPH) = Terphenyl-d14	18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S4 (PHL) = Phenol-d5	24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

SUR.2S

LDC #: 12691C2b
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B19-S	C3-S	( )	( )	141 (≤ 50)	None	No qual
		(K2406170)	C4-S	( )	( )	98 ( )		
			C2-NN	( )	( )	51 ( )		
			C3-NN	( )	( )	83 ( )		
			C1-UUUS	( )	( )	75 ( )		
			C3-UUUS	( )	( )	NC ( )		
			C1-UUUW	( )	( )	57 ( )		
			C2-UUUW	( )	( )	61 ( )		
			C3-UUUW	( )	( )	88 ( )		
			C4-DDD	( )	( )	51 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #:
SDG #: 12406296

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S, W,	DD, JJ, GG)	NN, VV, KKK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12691D2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406519 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26 - 27/04
II.	GC/MS Instrument performance check	N	Not reviewed for level II
III.	Initial calibration	N	↓
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DMP	A/SW	
VIII.	Laboratory control samples	A/SW	LCS/D, SRM.
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level II
XI.	Target compound identification	N	↓
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	↓
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	✓	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	LDW-B9a-S sed	11	KWG0414432-T	21		31	
2	LDW-B3a-S ✓	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1-Methylnaphthalene
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Dibenzothiophene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12691D2b
SDG #: k2406519

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9
2nd Reviewer: 9

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/20/04 **Blank analysis date:** 9/28/04
Conc. units: ug/L Associated Samples: All

Compound	Blank ID	Sample Identification								
[redacted]	044432-	7	2							
s	0.59	(3.6)	(3.7)							

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12691D2b
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LCSW-B1a-S	C3-S	( )	( )	41 (≤ 50)	None	No Qual
		(K2406TU)	C4-S	( )	( )	98 ( )		
			C2-NN	( )	( )	51 ( )		
			C3-NN	( )	( )	83 ( )		
			C1-UUUS	( )	( )	75 ( )		
			C3-UUUS	( )	( )	NC ( )		
			C1-UUUW	( )	( )	57 ( )		
			C2-UUUW	( )	( )	61 ( )		
			C3-UUUW	( )	( )	88 ( )		
			C4-DDD	( )	( )	51 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: [illegible]
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S, W,	DD. JJ. GG)	NN, VV. KKK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12691E2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2406580 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 1
2nd Reviewer: 2

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
II.	GC/MS Instrument performance check	N	Not reviewed for level III
III.	Initial calibration	N	↓
IV.	Continuing calibration	N	↓
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	A/SW	
VIII.	Laboratory control samples	A/SW	LCS/D. SRM.
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for level III
XI.	Target compound identification	N	↓
XII.	Compound quantitation/CRQLs	N	↓
XIII.	Tentitatively identified compounds (TICs)	N	↓
XIV.	System performance	N	↓
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	LDW-B7a-S sed	11	KWG0401328T8-4	21		31	
2	LDW-B7a-SMS ↓	12		22		32	
3	LDW-B7a-SMSD	13		23		33	
4	LDW-B7a-SDUP ↓	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1-Methylnaphthalene
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Dibenzothiophene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 17691E2b
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 0

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/3/04 **Blank analysis date:** 9/25/04
Conc. units: ug/Kg Associated Samples: All

Compound	Blank ID	Sample Identification								
~~LMW~~ HMW	13378-4	1								
S	0.78	3.5/4.7U								
W	0.35	(3.8)								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12691E2b
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: A
2nd Reviewer: AR

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

(Y) N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		1/4	NN	~~(42-144)~~ 5X RL	( )	75 (≤50)	1	No qual
			DD	( )	( )	72 ( )		
			NN	( )	( )	76 ( )		
			Cl-NN	( )	( )	NC ( )		
			C3-NN	( )	( )	51 ( )		
			UUU	( )	( )	66 ( )		
			Cl-UUU	( )	( )	55 ( )		
			C2-UUU	( )	( )	56 ( )		
			UU	( )	( )	57 ( )		J detects/A
			VV	( )	( )	58 ( )		
			Perylene	( )	( )	56 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

SDG #: K2406580

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S.W.	DD.JJ.GG)	NN.VV.KKK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12691F2b **VALIDATION COMPLETENESS WORKSHEET** Date: 10/30/04
SDG #: K2407012 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: M

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17 - 25/04
II.	GC/MS Instrument performance check	N	Not reviewed for Level II
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A/SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	A/SW	
VIII.	Laboratory control samples	A/SW	LCS/D, SRM
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	Not reviewed for Level II
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	LDW-B8a-S sed	11	HWG0414432-T	21		31	
2	LDW-B10a-S	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1-Methylnaphthalene
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Dibenzothiophene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 12691F2b
SDG #: K240T012

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 4
2nd Reviewer: 4

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 9/22/04 **Blank analysis date:** 9/27/04
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
~~MW~~	4432	7 1	3	2						
S	0.59	(4.3)	(38)	28/5.0						

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 126912b
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 8

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B1a-S	C3-S	( )	( )	141 (≤ 50)	None	No qual
		(K2406170)	C4-S	( )	( )	98 ( )		
			C2-NN	( )	( )	51 ( )		
			C3-NN	( )	( )	83 ( )		
			C1-UUUS	( )	( )	75 ( )		
			C3-UUUS	( )	( )	NC ( )		
			C1-UUUN	( )	( )	57 ( )		
			C2-UUUN	( )	( )	6 ( )		
			C3-UUUN	( )	( )	88 ( )		
			C4-DDD	( )	( )	51 ( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

SDG #: K240T012

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?
[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S.W. DD. JJ. GG	)	NN, VV. KKK	( )		Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LCSLCSD.2S

LDC #: 12734C2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407595 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: Q
2nd Reviewer: M

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27-28/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates / DUP	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	LDW-B1b-S sed	11	KWG0415421-9	21		31	
2	LDW-B2b-S	12		22		32	
3	LDW-B4b-S	13		23		33	
4	LDW-B5b-S	14		24		34	
5	LDW-B1b-SMS	15		25		35	
6	LDW-B1b-SMSD	16		26		36	
7	LDW-B1b-SDUP	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. Benzo(e)pyrene
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Perylene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 12T34c2b
SDG #: k240T595

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: MC

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a method blank analyzed for each matrix?
(Y) N N/A Was a method blank analyzed for each concentration preparation level?
(Y) N N/A Was a method blank associated with every sample?
Y (N) N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/8/04 **Blank analysis date:** 10/20/04
Conc. units: ug/kg Associated Samples: ALL

Compound	Blank ID	Sample Identification								
Limit	041521-9	1	2	3	4					
5	1.0	4.4/5.4	(12)	(23)	(10)					

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

SDG #: K2407595
METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Page: 1 of 1
Reviewer: q
2nd Reviewer: 8

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y [✓ N] N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N [✓ N/A] If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N [✓ N/A] If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		3	NN-d10	36 (40-130)	No qual.
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory

	QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116
S3 (TPH) = Terphenyl-d14	18-137	33-141
S4 (PHL) = Phenol-d5	24-113	10-94
S5 (2FP) = 2-Fluorophenol	25-121	21-100
S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

LDC #: 12734c2b
SDG #: k240759

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: AC

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		5/6	See	attachment	( )	( )	1	See Qual
				( )	( )	( )		
		1/7	S	(<5x of RL)	( )	53 (≤50)		No Qual
			GG	( )	( )	63 ( )		↓
			C2-NNs	↓ ( )	( )	NC ( )		↓
			YY	( )	( )	51 ( )		↓dets/A
			FFF	( )	( )	66 ( )		↓
			HHH	( )	( )	61 ( )		
			TTT	( )	( )	76 ( )		
			III	( )	( )	81 ( )		↓
			UUU	(<5x of RL)	( )	60 ( )		No Qual
			VVV	( )	( )	98 ( )		↓dets/A
			KKK	(<5x of RL)	( )	85 ( )		No Qual
			LLL	( )	( )	102 ( )		↓dets/B
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
B.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
D.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
E.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

ient: Windward Environmental
oject: LDW Benthic Invertebrate Survey/04-08-06-21
mple Matrix: Sediment

Service Request: K2407595
Date Extracted: 10/08/2004
Date Analyzed: 10/20/2004

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

mple Name: LDW-B1b-S
b Code: K2407595-001

traction Method: EPA 3541
alysis Method: 8270C SIM

Units: ug/Kg
Basis: Dry

Level: Low
Extraction Lot: KWG0415421

		LDW-B1b-SMS KWG0415421-1 Matrix Spike			LDW-B1b-SDMS KWG0415421-2 Duplicate Matrix Spike					
alyte Name	Sample Result	Result	Expected	%Rec	Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
phthalene	4.4	473	493	95	1880	494	379 *	40-130	119 *	50
Methylnaphthalene	2.7	433	493	87	815	494	164 *	40-130	61 *	50
Methylnaphthalene	2.4	459	493	93	715	494	144 *	40-130	44	50
henyl	1.8	441	493	89	926	494	187 *	40-130	71 *	50
enaphthylene	3.9	431	493	87	1350	494	273 *	40-130	103 *	50
benzofuran	5.2	461	493	92	727	494	146 *	40-130	45	50
enaphthene	4.4	512	493	103	713	494	144 *	40-130	33	50
orene	6.6	418	493	83	822	494	165 *	40-130	65 *	50
benzothiophene	2.1	372	493	75	1150	494	232 *	40-130	102 *	50
enanthrene	38	637	493	121	7540	494	1521 *	40-130	169 *	50
thracene	16	449	493	88	2990	494	603 *	40-130	148 *	50
oranthene	190	1010	493	168 *	34600E	494	6981 *	40-130	189 *	50
rene	140	920	493	158 *	35800E	494	7231 *	40-130	190 *	50
nz(a)anthracene	35	413	493	77	13100	494	2637 *	40-130	188 *	50
rysene	57	529	493	96	15700	494	3175 *	40-130	187 *	50
nzo(b)fluoranthene	28	425	493	80	16700	494	3370 *	40-130	190 *	50
nzo(k)fluoranthene	25	388	493	74	7170	494	1447 *	40-130	179 *	50
nzo(e)pyrene	24	463	493	89	13300	494	2688 *	40-130	187 *	50
nzo(a)pyrene	23	369	493	70	18800	494	3802 *	40-130	192 *	50
rylene	11	575	493	114	5780	494	1169 *	40-130	164 *	50
leno(1,2,3-cd)pyrene	14	356	493	69	15000	494	3041 *	40-130	191 *	50
benz(a,h)anthracene	2.6	276	493	55	2040	494	413 *	40-130	152 *	50
nzo(g,h,i)perylene	16	435	493	85	16900	494	3419 *	40-130	190 *	50

ults flagged with an asterisk (*) indicate values outside control criteria.
ults flagged with a pound (#) indicate the control criteria is not applicable.
cent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

LDC #: K1534C3D
SDG #: K2407595

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

[✓ Y] N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S. W.	DD. JJ. GG)	NN, VV. KKK	( )	M + Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12740A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407473 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 1
2nd Reviewer: 2

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM) + Alkylated PAHs

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II.	GC/MS Instrument performance check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	~~A~~ SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	LDW-B5a-S	11	KWG0416619-6	21		31	
2	LDW-B5a-SMS	12		22		32	
3	LDW-B5a-SMSD	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 15740A=b
SDG #: k24074

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 6 of 1
Reviewer: 9
2nd Reviewer: 8

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/25/04 **Blank analysis date:** 11/3/04
Conc. units: ug/L Associated Samples: all

Compound	Blank ID	Sample Identification								
	KWG0416619-6	1								
S	0.87	(10)								

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 12740B-b
SDG #: K2407T3

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 9

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		2/3	GGG	133 (40-130	( )	( )	1	J det, A
			NN	134 (↓)	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		No Duplicate Dups.		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: B140A-D
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?
[✓ Y] ~~N~~ N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		No SRM	S, W, DD, JJ, GG, NN, VV, ~~KKK~~	)		( )	All + Bk	Text
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12631A3a
SDG #: K2406516
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II/~~IV~~

Date: 10/28/04
Page: 6f 7
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 → 8/27/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	Not reviewed for Level II validation. %RSD, $r^2 \geq 0.990$
IV.	Continuing calibration	N SW	Not reviewed for Level II validation. ICV ± 15
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates / DUP	A/A	
VIII.	Laboratory control samples / SRM	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	NA	Not reviewed for Level II validation.
XII.	Compound quantitation and reported CRQLs	SW	Not reviewed for Level II validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	~~SW~~ N	D = 16 + 17, 2,4 3+5
XV.	Field blanks	N	8 a 11, 9 a 11, 10 15

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ~~* Indicates sample underwent Level IV validation~~ Sediments

1	LDW-C4-S	11	LDW-C7-S2	21	LDW-C2-S2MS	31	KWG0413102-6
2	LDW-C10-S2	12	LDW-C8-S	22	LDW-C2-S2MSD	32	
3	LDW-C10-S2DL	13	LDW-C8-SDL	23	LDW-C2-S2DUP	33	
4	LDW-C10-S1	14	LDW-C5-S	24	LDW-C10-S1DL	34	
5	LDW-C10-S1DL	15	LDW-C3-S1	25		35	
6	LDW-C6-S	16	LDW-C2-S1	26		36	
7	LDW-C9-S	17	LDW-C2-S2	27		37	
8	LDW-C7-S1	18	LDW-C1-S	28		38	
9	LDW-C7-S1DL	19	LDW-C9-SMS	29		39	
10	LDW-C3-S2	20	LDW-C9-SMSD	30		40	

PEST-SW.wpd

216

LDC #: 12631A39
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET

Page: 1 of 1
Reviewer: B
2nd Reviewer: BK

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:

LDC #: 1263A3a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples, standards and blanks?
Y N N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		2		PCB	46 (50-150)	J/UJ/A
					( )	
		3		TCMX	0 ( )	NO QUAL DIL 100X
				PCB	0 ( )	↓
		3MS			0 ( )	
					( )	
		3D		DCMX	0 ( )	NO QUAL DIL 200X
				DCB	0 ( )	↓
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
				DCB =	decachlorobiphenyl	
				TCMX	Tetrachlorom xylene	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A				
B				

LDC #: 12631A3a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples (LCS)~~ SRM

Page: 1 of 1
Reviewer: PJ
2nd Reviewer: LQ

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y [✓ N] N/A Were the ~~LCS~~ SRM ~~percent recoveries (%R) and relative percent differences (RPD)~~ Amt within the QC limits?

Level IV/D Only

Y N [✓ N/A] Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	~~LCS/LCSD ID~~	Compound	~~LCS~~ SRM ug/kg ~~%R~~ (Limits)	LCSD ~~%R~~ (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	SRM 1944	T	32 (3.0-15	( )	( )	All + Blk	Jdet/P
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12631A3a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Q, 2,4'-DDD	Exceeded cal range	2	J/A det
	2,4'-DDD	↓	4	↓
	T, Q, 2,4'-DDT	↓	12	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12603|A3a
SDG #: K24065|6

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer:
2nd Reviewer:

METHOD: / GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	J	1	67	J/A dit
	Mirex	2	46	
	~~4,4'-DDT~~ FM	~~4,4'-DDT~~ FM	~~160~~ FM	
	2,4-DDD	4	43	
	J	6	76	
	S	7	67	
	2,4-DDD	↓	82	
	D	8	97	
	C		67	
	H		67	
	R	↓	43	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12631A3a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	sample ID ~~Finding~~	%D Between 2 column Associated Samples ≤40	Qualifications
	R	10	58	J/A det
	R	11	74	
	D	12	73	
	H	↓	77	
	M		51	
	R		58	
	H	14	43	
	B	15	61	
	J		75	
	P	↓	76	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12631A3a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: JB
2nd Reviewer: LC

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding (Sample ID)	Associated Samples (%RPD Between 2 column)	Qualifications
	T	16	46	J/A det
	J	↓	88	
				↓
	T	18	69	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 1263/A3a
SDG #: K24065/6

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding (%RPD Between 2 columns ±40)	Associated Samples	Qualifications
	2,4'-DDD	43	5	J/A det
	D	200	9	↓
	H	63	↓	↓
	R	5	↓	↓
	D	60	13	↓
	H	78	↓	↓
	M	68	↓	↓
	R	78	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 1263/A3a
SDG #: K2406576

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: M
2nd Reviewer: R

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	2,4'-DDD	exceeded cal range	2	R/A
	all except 2,4-DDD	diluted	3	R/A
	2,4-DDD	exceeded cal range	4	R/A
	o	it was reported DD	4	R/A
	all except 2,4-DDD	diluted	5	R/A
	all except o	diluted	24	R/A

Comments: _____

LDC #: 12631A3a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	P, T, H, K, M, R O, 2,4'-DDT	results of these compounds are lower	8	~~R~~ R/A
	all except Above	diluted	9	R/A
	T, O, 2,4'-DDT	exceeded cal range	12	
	C, D, H, M, R	results of these compounds are lower	12	R/A
	all except T, O, 2,4'-DDT, C, D, H, M, R	diluted	13	R/A

Comments: _____

OVRNew.wpd

LDC #: 12691A3a
SDG #: K2406170
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 11/9/04
Page: 1 of 1
Reviewer: JB
2nd Reviewer: DL

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/11 - 8/16/04
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	%RSD, r^2 ≥0.990
IV.	Continuing calibration	SW	ICV ≤15
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DMP	SW SW	LDW-B5a-SDUP
VIII.	Laboratory control samples SRM	A/SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	A	GPC clean-up performed
XI.	Target compound identification	SW	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediments

1	LDW-B2a-S	11	KWG0414494-9	21		31	
2	LDW-B6a-S	12		22		32	
3	LDW-B4a-S	13		23		33	
4	LDW-B1a-S	14		24		34	
5	LDW-B9b-S	15		25		35	
6	LDW-B6a-SMS	16		26		36	
7	LDW-B6a-SMSD	17		27		37	
8	LDW-B1a-SMS	18		28		38	
9	LDW-B1a-SMSD	19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 12619A3a
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: EF
2nd Reviewer: EF

Method: Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.		✓		
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) $\leq$ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	✓			
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were the RT windows properly established?	✓			
Were the required standard concentrations analyzed in the initial calibration?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?	✓			
Were endrin and 4,4'-DDT breakdowns $\leq$ 15%.0 for individual breakdown in the Evaluation mix standards?	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) $\leq$ 15%.0 or percent recovieries 85-115%?		✓		
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Were extract cleanup blanks analyzed with every batch requiring clean-up?	✓			GPC
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

LDC #: 12691A39
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: JS
2nd Reviewer: DC

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	NA	✓		
Target compounds were detected in the field duplicates.			✓	
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 12619A39
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd Reviewer:

All circled dates have exceeded the technical holding times.
Y/N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All	sediment	cooler	temp = 11°C				J/UJ/A per Text

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 12619A39
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

What type or calibration verification calculation was performed? ___ %D or ___ RPD

[✓ Y] N N/A Were Evaluation mix standards run before initial calibration and before samples?

[✓ Y] N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

[✓ Y] N N/A Was at least one standard run daily to verify the working curve?

Y [✓ N] N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/D Only

[✓ Y] N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	10/7/04	1006F046-049	RB-XLB	P	16	( )	5	J/UJ/A
						( )		
			DB-35MS	P	16	( )	↓	↓
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		

A. alpha-BHC
B. beta-BHC
C. delta-BHC
D. gamma-BHC
E. Heptachlor
F. Aldrin
G. Heptachlor epoxide
H. Endosulfan I
I. Dieldrin
J. 4,4'-DDE
K. Endrin
L. Endosulfan II
M. 4,4'-DDD
N. Endosulfan sulfate
O. 4,4'-DDT
P. Methoxychlor
Q. Endrin ketone
R. Endrin aldehyde
S. alpha-Chlordane
T. gamma-Chlordane
U. Toxaphene
V. Aroclor-1016
W. Aroclor-1221
X. Aroclor-1232
Y. Aroclor-1242
Z. Aroclor-1248
AA. Aroclor-1254
BB. Aroclor-1260
CC. DB 608
DD. DB 1701
EE.______
FF.______
GG.______
HH.______
II.______
JJ.______

C:\WPDOCS\WRK\PEST\CONCAL.3S

LDC #: 12619A39
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		~~LDW-B360~~		( )	( )	( )		
		6 & 7	T	( )	( )	57 (50)	#2	J/UJ/A
			H	44 (50-150)	( )	( )		
			J	( )	36 (50-150)	( )		
			L	47 (50-150)	( )	57 (50)		
			R	49 ( )	( )	( )		
			O	29 ( )	( )	74 (50)		
			P	49 ( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12619LA39
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: B
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B69-SDUP	sediment	J	64 (50)	LDW-B69-S	NO SMAL samples
			M	91	↓	is not associated
			O	82	↓	with this SDG
			2,4'-DDD	78	↓	
			2,4'-DDT	80	↓	

Comments:

DUPNew.wpd

LDC #: 126191A3a
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~
Standard Reference Material (SRM)

Page: 1 of 1
Reviewer: B
2nd Reviewer: K

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a ~~laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?~~ SRM

Y (N) N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ SRM concentration (ug/kg)

Level IV/D Only

Y N (N/A) Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	SRM ~~LCS/LCSD ID~~	Compound	ug/kg ~~LCS~~ SRM ~~%R~~ (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	SRM	1944 (alpha-BHC)	5.95 (0.85→3.5)	( )	( )	All + Blk	J det/P
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 12691A3a
SDG #: K240617

VALIDATION FINDINGS WORKSHEET
Target Compound Identification

Page: 1 of 1
Reviewer: JG
2nd Reviewer:

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were the retention times for detected target compounds within their retention time windows?

#	Sample ID	Column / Detector	Compound	RT (Limits)	Qualifications
	All	Due to the	presence	of PCB in the sample,	NJ det
		all detected	compounds, are	( )	
		presumptive	and	estimated ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

Comments:

LDC #: 12691A3a
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846, 8081)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, cleanup, activities, etc.?
Y N N/A Did the recalculated results for detected target compounds agree within 10.0% of the reported results?

#	Date	compound ~~Lab ID/Reference~~	%RPD Between 2 column ±40 Finding	Associated Samples	Qualifications
		N	49	#1	J/A det
		S	84	2	
		J	79	↓	↓
		J	86	3	↓
		2,4'-DDT	51	4	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 1269A3a
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC / HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (50 std)	Recalculated CF (50 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	CAL 3865 DB-XLB GC 23	10/1/04	endosulfan I	3.04×10^5	3.04×10^5	313000	313000	9.6	9.6
			methoxychlor	1.53×10^5	1.53×10^5	161000	161000	15.0	15.0
2	PB-35MS GC-23	10/1/04	↓	4.98×10^5	4.98×10^5	515000	515000	13.4	13.4
				2.89×10^5	2.98×10^5	300000	300000	15.4	15.4
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691 A29
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JF
2nd Reviewer: JF

METHOD: GC ✓ HPLC ____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	1006F025-029	10/6/04	endosulfan I	313000	283000	283000	10	10
			methoxychlor	161000	141000	141000	12	12
	DB-XLB							
2	DB-35MS		↓	515000	467000	467000	9	9
			↓	300000	261000	261000	13	13
3	1006F046-F047	10/7/04	↓	313000	292000	292000	7	7
			↓	161000	135000	135000	16	16
	DB-XLB							
4	DB-35MS		↓	515000	484000	484000	6	6
			↓	300000	253000	253000	16	16

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CONCLC.1S

LDC #: 12691A3a
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene	DB-XLB	100	77.75	78	78	0
Decachlorobiphenyl	↓	↓	64.65	65	65	0
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Notes:

LDC #: 12691A39
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) and Relative Percent difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery
MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 6 + 7

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC	20.0	20.0	0.18	13.3	12.4	66	65	61	61	7	7
Heptachlor			ND	15.0	15.1	75	75	76	76	1	1
Aldrin				14.6	15.7	73	73	78	78	7	7
Dieldrin				12.4	12.4	62	62	62	62	0	0
Endrin				14.7	15.6	74	74	78	78	6	6
4,4'-DDT			9.3	15.1	33	29	29	119	119	74	74

Comments: Refer ot Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691A39
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: A
2nd Reviewer: QR

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Concentration

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery; LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: KW G0414494-5

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration ( )		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	-	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Gamma-BHC	20.0	NA	180	18.4	NA	92	92				
Heptachlor				17.6		88	88				
Aldrin				17.3		87	87				
Dieldrin				17.9		89	89				
Endrin				18.8		94	94				
4,4'-DDT				18.2		91	91	NA			

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691A3a
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Example:

Sample I.D. #1 Alpha chlordane

Conc. = $\frac{(716631 \times 4 \times 1)}{(588000 \quad 40.07 \quad 0.52)}$

=

0.24 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Note:

LDC #: 12691B3a
SDG #: K2406226
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/8/04
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/10 – 8/13/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates / DUP	SW/SW	LDW-B6a-S MS/MSD, LDW-B3a-S MS/MSD, LDW-B5a-S Dup
VIII.	Laboratory control samples / SRM	A/SW	
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1 +	LDW-B7b-S 8/13	11		21		31	
2 +	LDW-B3b-S 8/10	12		22		32	
3	KWG0414494-9	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12691B3a
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:

LDC #: 12691B3a
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FB
2nd Reviewer: Q

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B6a-S	T	( )	( )	57 (50)		No qual no associated sample
			H	44 (50-150)	( )	( )		
			J	( )	36 (50-150)	( )		
			L	47 (50-150)	( )	57 (50)		
			R	49 (50-150)	( )	( )		
			O	29 (↓)	( )	74 (50)		
			P	49 (50-150)	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12691B3a
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: B
2nd Reviewer: A

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?
Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?
LEVEL IV ONLY:
Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B6a-SDUP	sediment	~~X~~ J	64 (50)	LDW-B6a-S	NO QUAL, sample is not part of this SDG
			M	91		
			O	82		
			2,4'-DDD	78		
			2,4'-DDT	80		

Comments: _____

DUPNew.wpd

LDC #: 12691B3a
SDG #: K2406226
Page: 6 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples~~ SRM

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? ______

Y [✓ N] N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits~~? SRM Amt

Level IV/D Only

Y N [✓ N/A] Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	SRM ~~LCS/LCSD ID~~	Compound	~~LCS~~ SRM ng/kg %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		SRM 1944	A	5.95 (0.85-3.5)	( )	( )	All + Blk	J det ect / P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12691B3a
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: JT
2nd Reviewer: AC

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD ~~%D~~ Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	6	1	67	J/A det

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691C3a
SDG #: K2406296
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/08/04
Page: 1 of
Reviewer:
2nd Reviewer:

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/18 — 8/19/04
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DUP	SW SW	LDW-B6a-S MS/MSD, LDW-B19-SMS/MSD LDW-B8a-SDUP
VIII.	Laboratory control samples SRM	A/SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B6b-S 8/18	11		21		31	
2	LDW-B8b-S 19	12		22		32	
3	LDW-B10b-S 19	13		23		33	
4	KWG0414494-9	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 12691C3a
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B6a-S	T	( )	( )	57 (50)		No qual no
			H	44 (50-150)	( )	( )		Associated sample
			J	( )	36 (50-150)	( )		
			L	47 (50-150)	( )	57 (50)		
			R	49 (50-150)	( )	( )		
			Θ	29 (↓)	( )	74 (50)		↓
			P	49 (50-150)	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12691C3a
SDG #: K2406296

METHOD: GC ___ HPLC

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B6a-SDUP	sediment	~~4,4'~~ J	64 (50)	LDW-B6a-S	NO QUAL, sample is not part of this SDG
			M	91		
			O	82		
			2,4'-DDD	78		
			2,4'-DDT	80		

Comments: _____

DUPNew.wpd

LDC #: 12691C3a

SDG #: K2406296

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples~~ SRM

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? ________

Y [✓ N] N/A Were the ~~LCS~~ SRM ~~percent recoveries (%R)~~ Amt ~~and relative percent differences (RPD) within the QC limits~~?

Level IV/D Only

Y N [✓ N/A] Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	~~LCS/LCSD ID~~ SRM	Compound	ng/kg ~~LCS~~ SRM) %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		SRM 1944	A	5.95 (0.85-3.5)	( )	( )	All + Blk	J det ect /P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 1269C3a
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding (%RPD Between 2 column ± 40)	Associated Samples	Qualifications
	M	30.	#1	J/A det
	Q	136	1	↓
	O	55	3	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691D3a
SDG #: K2406519
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/08/04
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A ~~SW~~	Sampling dates: 8/26 — 8/27/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	~~DUP~~ ~~SW~~ SW	LDW-B6a-S MS/MSD LDW-B9-SMS/D LDW'-B5a-SDup
VIII.	Laboratory control samples	~~SRM~~ A/SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B9a-S 27	11		21		31	
2	LDW-B3a-S 26	12		22		32	
3	KWG0414494-9	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 12691D3a
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B6a-S	T	( )	( )	57 (50)		No qual no associated sample
			H	44 (50-150)	( )	( )		
			J	( )	36 (50-150)	( )		
			L	47 (50-150)	( )	57 (50)		
			R	49 (50-150)	( )	( )		
			O	29 (↓)	( )	74 (50)		
			P	49 (50-150)	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12691D3a
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A   Was a duplicate sample analyzed for each matrix in this SDG?
Y N N/A   Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A   Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B6a-SDUP	sediment	J	64 (50)	LDW-B6a-S	No QUAL, sample is not part of this SDG
			M	91	↓	
			O	82		
			2,4-DDD	78		
			2,4-DDT	80 ↓	↓	

Comments:

DUPNew.wpd

LDC #: 12691D3a
SDG #: K2406519
METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples~~ SRM

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? ______

Y [✓ N] N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits~~?
SRM Amt

Level IV/D Only

Y N [✓ N/A] Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	SRM ~~LCS/LCSD ID~~	Compound	~~LCS~~ SRM ng/kg %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		SRM 1944	A	5.95 (0.85-3.5)	( )	( )	All + Blk	Jdetect/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12691D3a
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846, 8081)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, cleanup, activities, etc.?
Y N N/A Did the recalculated results for detected target compounds agree within 10.0% of the reported results?

#	Date	compound ~~Lab ID/Reference~~	% RPD Between 2 column Finding ≤40	Associated Samples	Qualifications
		Hexachlorobenzene	56	#1	J/A dut
		Q	81	↓	↓
		2,4'-DDT	69	↓	↓
		J	95	2	J/A dut
		M	53	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691E3a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/8/04
SDG #: K2406580 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/30/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A SW	
VII.	Matrix spike/Matrix spike duplicates DUP	SW SW	LDW-B6a-S MS/MSD, LDW-B1a-S MS/MSD LDW-B5a-SDUP
VIII.	Laboratory control samples SRM	A SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	SW	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

1	LDW-B7a-S 8/30	11		21		31	
2	LDW-B7a-SDL ↓	12		22		32	
3	KWG0414494-9	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes: _____

LDC #: 12691E3a
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A'.

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B6a-S	T	( )	( )	57 (50)		No qual no associated sample
			H	44 (50-150)	( )	( )		
			J	( )	36 (50-150)	( )		
			L	47 (50-150)	( )	57 (50)		
			R	49 (50-150	( )	( )		
			O	29 (↓)	( )	74 (50)		
			P	49 (50-150)	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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DC #: 12691E3a
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ~~GC~~ ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?
Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B6a-SDUP	sediment	~~I~~ J	64 (50)	LDW-B6a-S	No qual, sample is not part of this SDG
			M	91	↓	
			O	82	↓	
			2,4-DDD	78	↓	
			2,4-DDT	80	↓	

Comments:

DUPNew.wpd

LDC #: 12691E3a
SDG #: K2406580
METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples~~ SRM

Page: 1 of 1
Reviewer:
2nd Reviewer:

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y [✓ N] N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits~~? SRM Amt

Level IV/D Only

Y N [✓ N/A] Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	SRM ~~LCS/LCSD ID~~	Compound	~~LCS~~ SRM ng/kg ~~%R~~ (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		SRM 1944	A	5.95 (0.85-3.5)	( )	( )	All + Blk	J detect/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12691E3a
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846, 8081)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, cleanup, activities, etc.?
Y N N/A Did the recalculated results for detected target compounds agree within 10.0% of the reported results?

#	Date	compound ~~Lab ID~~/Reference	Finding	Associated Samples	Qualifications
		Hexachlorobenzene	exceeded cal range	#1	J/A det
			%RPD Between 2 columns ≤ 40		
		~~Hexachlorobenzene~~ J P1	91	#1	J/A det
		J	105	#2	J/A det

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691E3a
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		Hexachlorobenzene	exceeded cal range	#1	R/A
		T, J, M, N, O, Q	results are lower	#1	R/A
		U, 2,4'-DDE,			
		2,4-DDT			
		All except	Diluted	2	R/A
		Hexachlorobenzene,			
		T, J, M, N, O, Q			
		U, 2,4'-DDE,			
		2,4'-DDT			

Comments:

LDC #: 12691F3a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/07/04
SDG #: K2407012 Level II Page: 1 of
Laboratory: Columbia Analytical Services Reviewer:
2nd Reviewer:

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/16/04 - 8/25/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DMP	SW SW	LDW-B6q-S MS/MSD, LDW-B1a-S MS/MSD
VIII.	Laboratory control samples SRM	A/SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	SW	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: sediment

1	LDW-B5a-S 8/16	11	KWG0414494-9	21		31	
2	LDW-B8a-S 8/17	12		22		32	
3	LDW-B8a-SDL 8/17	13		23		33	
4	LDW-B10a-S 8/25	14		24		34	
5	LDW-B5a-SDUP 8/16	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 12691F3a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: B
2nd Reviewer: C

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B6a-S	T	( )	( )	57 (50)		No qual no associated sample
			H	44 (50-150)	( )	( )		
			J	( )	36 (50-150)	( )		
			L	47 (50-150)	( )	57 (50)		
			R	49 (50-150)	( )	( )		
			O	29 (↓)	( )	74 (50)		
			P	49 (50-150)	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12691F3a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: EB
2nd Reviewer: AP

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
5.8/11	5	sediment	J	64 (50)	#1	J (all detects)/A
12/33			M	91		
11/27			O	82		
5.2/13			2,4'-DDD	78		
4.9/11			2,4'-DDT	81		

Comments: MRL = 1.0

DUPNew.wpd

LDC #: 12691F3a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples~~ SRM

Page: 1 of 1
Reviewer: B
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y (N) N/A Were the ~~LCS~~ SRM ~~percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ Amt

Level IV/D Only

Y N (N/A) Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	SRM ~~LCS/LCSD ID~~	Compound	~~LCS~~ SRM ug/kg ~~%R~~ (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
				( )	( )	( )		
		SRM 1944	A	5.95 (0.85-3.5)	( )	( )	All + Blk	J det ect / P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC #: 12691F3a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	%D Between 2 columns ≤40 Finding	Associated Samples	Qualifications
	T	50	#1	J/A det
	L	63		
	2,4'-DDD	62	4	J/A det
	2,4'-DDT	58	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 1269|F3a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Q, H, 2,4'-DDP, 2,4'-DDT	Exceeded cal range	#2	Jdet/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12091F3a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: AC

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		2,4'-DDD	exceeded cal range	#2	R/A
		A, J, ~~Z~~ O	lower result	#2	R/A
		All except 2,4'-DDD, A, J, O	diluted	#3	R/A

Comments: _____

C:\WPDOCS\WRK\PEST\OVR.3S

LDC #: 12734B3a

SDG #: K2407473

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/15/04

Page: 1 of 1

Reviewer: B

2nd Reviewer:

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	LDW-B5b-S DUP
VII.	Matrix spike/Matrix spike duplicates DUP/	A SW	LDW-B1b-S MS/MSD, LDW-B2b-SMS/MSD
VIII.	Laboratory control samples /SRM	SW/SW	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ~~Tissue~~ Sediment

1	LDW-B5a-S	11	KWG0411617-10	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes: _____

LDC #: 12734B3a
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples / SRM

Page: 1 of 1
Reviewer: B
2nd Reviewer: C

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? _____

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0416171-5/6	R	( )	25 (50-150)	67 (50)	All + Blk	J/UJ/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		SRM 1944	2,4'-DDD	74 ug/Kg (15-69)	( )	( )	All + Blk	Jdet/P
				( )	( )	( )		
			T	31 (3.0-15)	( )	( )	↓	Jdet/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12734B3a
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: /GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding (% RPD Between column ≤ 40)	Associated Samples	Qualifications
	D	83	#1	J/A det
	K	43	↓	↓
	L	88		
	2,4'-DDE	55		

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12734C3a
SDG #: K2407595
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/15/04
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27 - 9/28/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	A	
VIII.	Laboratory control samples /SRM	SW SW	Lcs ID
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1 †	LDW-B1b-S	11	KWG0416171-10	21		31	
2 †	LDW-B2b-S	12		22		32	
3 †	LDW-B4b-S	13		23		33	
4 †	LDW-B5b-S	14		24		34	
5	LDW-B1b-SMS	15		25		35	
6	LDW-B1b-SMSD	16		26		36	
7	LDW-B2b-SMS	17		27		37	
8	LDW-B2b-SMSD	18		28		38	
9	LDW-B5b-SDUP	19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 12734C 3a
SDG #: K2407595

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples /SRM

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? _____

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG041617I-	R	( )	25 (50-150)	67 (50)	All + Blk	J/UJ/P
		5/6		( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		SRM 1944	2,4'-DDD	74 ug/g (15-69)	( )	( )	All + Blk	Jdet/P
				( )	( )	( )		
			T	31 (3.0-15)	( )	( )	↓	Jdet/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12734C3a
SDG #: K2407595

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: B
2nd Reviewer: Q

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	% RPD Between 2 column Finding ≤ 40	Associated Samples	Qualifications
	R	91	#1	J/A det
	T	43	2	↓
	J	90	↓	↓
	o	92	3	↓
	G	88	4	↓
	J	63	↓	↓
	2,4'-DDD	66	↓	↓
	Mirex	72	↓	↓

Comments: See sample calculation verification worksheet for recalculations Note: #1, 2,4'-DDT % RPD = 40% (exactly)

LDC #: 12631A3b
SDG #: K2406516
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II/~~IV~~

Date: 10/28/04
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/15 - 8/27/04
II.	GC/ECD Instrument Performance Check	N ~~NA~~	
III.	Initial calibration	N ~~A~~	Not reviewed for Level II validation.
IV.	Continuing calibration	N ~~A~~	Not reviewed for Level II validation. ICV ≤ 15
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates / DUP	A/A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	~~NA~~	Not reviewed for Level II validation.
XII.	Compound quantitation and reported CRQLs	SW	Not reviewed for Level II validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	~~SW~~ N	D = ~~12 + 13~~ 2+3, 6+8 SR
XV.	Field blanks	N	~~7 + 11~~

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ~~* Indicates sample underwent Level IV validation~~ sediments

1	LDW-C4-S	11	LDW-C3-S1	21	KWG0413103-5	31	
2	LDW-C10-S2	12	LDW-C2-S1	22		32	
3	LDW-C10-S1	13	LDW-C2-S2	23		33	
4	LDW-C6-S	14	LDW-C1-S	24		34	
5	LDW-C9-S	15	LDW-C2-S2DUP	25		35	
6	LDW-C7-S1	16	LDW-C1-SMS	26		36	
7	LDW-C3-S2	17	LDW-C1-SMSD	27		37	
8	LDW-C7-S2	18		28		38	
9	LDW-C8 S	19		29		39	
10	LDW-C5-S	20		30		40	

PCB-SW.wpd

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LDC #: 12631J3D
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: EJ
2nd Reviewer: R

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	% Rpd Between 2 columns Finding ≤40	Associated Samples	Qualifications
	BB	42	8	J/A dlt
	BB	44	11	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691A3b
SDG #: K2406170
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 11/9/04
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/11 → 8/16/04
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A ~~N~~	
IV.	Continuing calibration	A ~~N~~	ICV ≤ 15
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	A SW	LDW-B39-S MS/MSD, LDW-B39-SDUP
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	A	GPC, sulfur clean up on all samples Mercury clean up on #1-3, 5
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	A	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediments

1 +	LDW-B2a-S	11	KWG0414495-6	21		31	
2 +	LDW-B6a-S	12		22		32	
3 +	LDW-B4a-S	13		23		33	
4 −	LDW-B1a-S	14		24		34	
5 +	LDW-B9b-S	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12691A36
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.		✓		
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) $\leq$ 20%?		✓		
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?			✓	
Did the initial calibration meet the curve fit acceptance criteria?	✓			
Were the RT windows properly established?	✓			
Were the required standard concentrations analyzed in the initial calibration?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?			✓	
Were endrin and 4,4'-DDT breakdowns $\leq$ 15%.0 for individual breakdown in the Evaluation mix standards?			✓	
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) $\leq$ 15%.0 or percent recovieries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Were extract cleanup blanks analyzed with every batch requiring clean-up?	✓			
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

LDC #: 12691A36
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes: _____

LDC #: 1269A36
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: [illegible]
2nd Reviewer: C

All circled dates have exceeded the technical holding times.
Y (N) N/A Were all cooler temperatures within validation criteria?

METHOD: (GC) HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All	cooler	temp =	11.0 °C				J/UJ/A-X

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

HTNew.wpd

LDC #: 12691A36
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

Recalculated in SDG # K2407012

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B5a-S DUP	sediment	BB	51 (50)	LDW-B5a-S	no QUAL this sample is not part of this SDG

Comments: _____

LDC #: 12691A36
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC / HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (1000 std)	Recalculated CF (1000 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	CAL3870 DB-35MS	10/01/04	1260-1	154	154	159	159	16.5	16.5
2	DB-XLB	10/01/04	↓	191	191	200	200	16.1	16.1
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691A36
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: EF
2nd Reviewer: CK

METHOD: GC_____ HPLC_____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	1004F017	10/5/04 00:26	1260-1	159	157	157	1	1
	DB-35MS							
2	DB-XLB	↓	↓	200	193	193	4	4
3	1006F022	10/6/04 19:47		159	143	143	10	10
	DB-35MS		↓					
4	DB-XLB			200	181	181	10	10

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CONCLC.1S

LDC #: 12691A3b
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl	DB-XLB	100	60.99	61	61	0
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Notes:

LDC #: 12691A3b
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) and Relative Percent difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery; MSD = Matrix spike duplicate percent recovery

MS/MSD samples: LDW-B39-S

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC											
Heptachlor											
Aldrin											
Dieldrin											
Encrin											
4,4'-DDT											
Aroclor 1260	199	199	ND	176	167	~~67~~ 88	88	84	84	5	7

Comments: Refer ot Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

C:\WPDOCS\WRK\PEST\MSDCLC.3S

LDC #: 12691A3b
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: G
2nd Reviewer: R

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: KWG0414495-5

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	-	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Gamma-BHC											
Heptachlor											
Aldrin											
Dieldrin											
Endrin											
4,4'-DDT											
Aroclor 1260	100	NA	0	165	NA	82	82	NA			

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691A36
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

1260-1 = $\frac{95075}{159}\ \frac{ug}{L} \times \frac{4ml}{40.07g} \times \frac{1kg}{1000ml} \times \frac{1000g}{1kg}$

= 59.69 ug/kg

1260-2 = $\frac{73665}{215} \times 0.09982531 = 34.20$

-3 = $\frac{93164}{248} \times 0.09982531 = 37.50$

-4 = $\frac{116600}{242} \times 0.09982531 = 48.098$

-5 = $\frac{91239}{325} \times 0.09982531 = 28.02$

Example:

Sample I.D. #1 1260

final Conc. = (39.90 FT 41.50) / (0.50)

= ~~79.80~~ ug/kg
83

aroclor 1260 = $\frac{1+2+3+4+5}{5}$

= $\frac{59.69+34.20+37.50+48.098+28.02}{5}$

= ~~39.90~~ 41.50

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Note: _____

LDC #: 12691A36
SDG #: K240617D

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: TS
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #1 Compound Name 1254

Final Concentration = $\frac{40}{0.5}$

= 8 ug/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications
	1254-1 = $\frac{845}{21085}$	09 x 1000 x $\frac{4ml}{40.07}$	= 40 ug/kg		
	1254 = $\frac{1+2+3+4+5}{5}$	=	$\frac{40+49+34+36+41}{5}$ = 40		
	1254 std = 1000 ppb				

Comments: ___

SAMPCALew.wpd

LDC #: 12691B3b

SDG #: K2406226

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/8/04

Page: 1 of 7

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/10 - 8/13/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DMP	A SW	LDW-B39-S MS/MSD, LDW-B59-SDUP
VIII.	Laboratory control samples LSR	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B7b-S	11		21		31	
2	LDW-B3b-S	12		22		32	
3	KWG0414495-6	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12691B36
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 50 ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B59-SDup	sediment	BB	51 (50)	LDW-B59-S	no qual sample is not part of this SDG

Comments: _____

DUPNew.wpd

LDC #: 12691C3b

SDG #: K2406296

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/8/04

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/18 → 8/19/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DUP	A SW	LDW-B3a-SMS/MSD, LDW-B5a-SDUP
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B6b-S	11		21		31	
2	LDW-B8b-S	12		22		32	
3	LDW-B10b-S	13		23		33	
4	KWG0404495-6	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes: _____

LDC #: 1269C36
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 50?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B5q-SDup	sediment	BB	51 (50)	LDW-B5q-S	no qual sample is not part of this SDG

Comments: _____

DUPNew.wpd

LDC #: 12691C3b
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: KP
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding (% RPD Between 2 column ≤ 40)	Associated Samples	Qualifications
	Y	~~48.6~~ 49	2	Jdet /A
	BB	~~42.0~~ 42	3	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691D3b

SDG #: K2406519

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/8/04

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/26 — 8/27/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DUP	A SW	~~LDW-B3a-S MS/MSD~~ LDW-B5a-S DUP
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; D = Duplicate; R = Rinsate; FB = Field blank; TB = Trip blank; EB = Equipment blank

Validated Samples: sediment

1	LDW-B9a-S	11		21		31	
2	LDW-B3a-S	12		22		32	
3	LDW-B3a-SMS	13		23		33	
4	LDW-B3a-SMSD	14		24		34	
5	KWG0414495-6	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12691D36
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: P
2nd Reviewer: CC

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 50 ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B5q-SDup	sediment	BB	51 (50)	LDW-B5q-S	no qual, sample is not part of this SDG

Comments:

DUPNew.wpd

LDC #: 12691E3b
SDG #: K2406580
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/8/04
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DUP	A SW	LDW-B39-SMS/MSD, LDW-B59-SDUP
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	~~N~~	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	~~A~~	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected D = Duplicate
R = Rinsate
FB = Field blank
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B7a-S	11		21		31	
2	KWG0414495-6	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 1269IE36
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: DE

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?
Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 50?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B5q-SDup	sediment	BB	51 (50)	LDW-B5q-S	no qual sample is not part of this SDG

Comments: _____

DUPNew.wpd

LDC #: 12691F3b

SDG #: K2407012

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/8/04

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/16 → 8/25/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates DUP	A SW	LDW-B39-SMS/MSD
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
D = Duplicate
R = Rinsate
FB = Field blank
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B5a-S	11		21		31	
2	LDW-B8a-S	12		22		32	
3	LDW-B10a-S	13		23		33	
4	LDW-B5a-SDUP	14		24		34	
5	KWG0414495-6	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes: _____

LDC #: 12691F3b
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	4	sediment	BB	51 (50)	#1	J det/A QUAL Y, Z, AA, BB
	BB = 40+68 ug/kg		MRL = 10 ug/kg			

Comments:

DUPNew.wpd

LDC #: 12691F36
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: / GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding (%RPD Between 2 column ≤ 40)	Associated Samples	Qualifications
	BB	42	1	J/A dil
	AA	44	2	J

Comments: See sample calculation verification worksheet for recalculations

COMQUANew.wpd

LDC #: 12734B3b

SDG #: K2407473

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/15/04

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DUP	A/A	LDW-B5b-S MS/MSD + LAB DUP
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: sediment

1	LDW-B5a-S	11		21		31	
2	KWG0411554-6	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12734C3b
SDG #: K2407595
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/15/04
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27 – 9/28/04
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	N	
IV.	Continuing calibration	N	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates /DMP	A/A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B1b-S	11	KWG0415514-6	21		31	
2	LDW-B2b-S	12		22		32	
3	LDW-B4b-S	13		23		33	
4	LDW-B5b-S	14		24		34	
5	LDW-B1b-SDUP	15		25		35	
6	LDW-B5b-SMS	16		26		36	
7	LDW-B5b-SMSD	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 12631A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/4/04
SDG #: K2406516 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: MJ
2nd Reviewer: [illegible]

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25-29/04
II.	Calibration	N	Not reviewed for Level II validation.
III.	Blanks	~~X~~ SW	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not reviewed.
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not Analyzed
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	N	Not reviewed for Level II validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	~~SW~~ N	~~(2,3), (6,8), (7,11), (12,13)~~ R
XIV.	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Sediment

1	LDW-C4-S	11	LDW-C3-S1	21		31	
2	LDW-C10-S2	12	LDW-C2-S1	22		32	
3	LDW-C10-S1	13	LDW-C2-S2	23		33	
4	LDW-C6-S	14	LDW-C1-S	24		34	
5	LDW-C9-S	15	LDW-C4-SMS	25		35	
6	LDW-C7-S1	16	LDW-C4-SDUP	26		36	
7	LDW-C3-S2	17	LDW-C3-S2MS	27		37	
8	LDW-C7-S2	18	LDW-C3-S2DUP	28		38	
9	LDW-C8-S	19	PB	29		39	
10	LDW-C5-S	20		30		40	

Notes: _____

12631A4W.wpd

323

LDC #: 1263184
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MB
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-14	Sediment	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN^-, ___ ___
15,16	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
17,18	↓	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-,

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 1263/A4
SDG #: K2406512

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Page: 1 of 1
Reviewer: MW
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020)
Soil preparation factor applied:
Sample Concentration units, unless otherwise noted: mg/kg
Associated Samples: All

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit										
Sb														
As						No Samples qualified (All > 10X Blank)								
Be														
Cd														
Ca														
Cr														
Fe														
Pb	0.15													
Li														
P														
Se														
Si														
Ag														
Na														
Tl														
Zn														
Zr														

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 1263|A4
SDG #: K2406576

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken. QAPP limits 70-130

(Y) (N) N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery? Yes for Sb. No for Zn.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	17	Sediment	Sb	52 (70-130)	All	J/UJ/A (post spike 111%)
			Zn	-9	↓	J-/R/A (No post spike)

Comments:

LDC #: 12631 A4
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Page: 1 of 1
Reviewer: MU
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Analyte	RPD (~~Limits~~ ≤30)	Difference (Limits)	Associated Samples	Qualifications
1	18	Sediment	Pb	31		A-1	J/UJ/A
			Mo	31		↓	↓
			Zn	67			

Comments:

DUP.4S2

LDC #: 12682A4
SDG #: K2407469
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/4/04
Page: 1 of 1
Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Arsenic (EPA SW 846 Method 6020)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/23, 24/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not reviewed.
V.	Matrix Spike Analysis	A	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not Utilized
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Sediment

1	SP-C-S1	11	B1-C-S5	21		31	
2	SP-C-S2	12	B1-C-S6	22		32	
3	SP-C-S3	13	SP-C-S2MS	23		33	
4	SP-C-S4	14	SP-C-S2DUP	24		34	
5	SP-C-S5	15	PB	25		35	
6	SP-C-S6	16		26		36	
7	B1-C-S1	17		27		37	
8	B1-C-S2	18		28		38	
9	B1-C-S3	19		29		39	
10	B1-C-S4	20		30		40	

Notes: _____

LDC #: 12682B4
SDG #: K2407471
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level IV

Date: 11/4/04
Page: 1 of 1
Reviewer: MM
2nd Reviewer: A

METHOD: Arsenic (EPA SW 846 Method 6020)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/16, 17/04
II.	Calibration	~~N~~ A	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	3 mg/kg from SDG K2407469
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	~~LCS~~ SRM
VIII.	Internal Standard (ICP-MS)	A	
IX.	Furnace Atomic Absorption QC	N	Not Applicable
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	A ~~N~~	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment.

1	LDW-BL-S-1	11		21		31	
2	LDW-EP-S1	12		22		32	
3	PB	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12682B4
SDG #: Kxto747

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: MR
2nd Reviewer:

Method: Metals (EPA SW 846 Method 6010/7000/6020) 4

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Was a midrange cyanide standard distilled?			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
IV. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients ≥ 0.995?			✓	
Do all applicable analysies have duplicate injections?			✓	

LDC #: 12682B4
SDG #: K1407471

VALIDATION FINDINGS CHECKLIST

Reviewer: MV
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%?			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			
Were all percent differences (%Ds) ≤ 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
VIII. Internal Standards (EPA SW 846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 26826H
SDG #: K2407471

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MM
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP/MS (Initial calibration)	As	26.84	25.0	107	107	Y
	GFAA (Initial calibration)						
	CVAA (Initial calibration)						
CCV	ICP/MS (Continuing calibration)	As	24.49	25.0	98	98	Y
	GFAA (Continuing calibration)						
	CVAA (Continuing calibration)						
	Cyanide (Initial calibration)						
	Cyanide (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CALCLC.4SW

LDC #: 12682B4
SDG #: K2407471

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000/6020

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recaluculated using the following formula:

$$\%R = \frac{Found}{True} \times 100$$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$$\%D = \frac{|I-SDR|}{I} \times 100$$

Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ZYSKB	ICP interference check	Ba	20.43	20	102	102	Y
LCS	Leboratory control sample		206	187	110	110	
SP-C-S2	Matrix spike		(SSR-SR) 106	105	101	101	
↓	Duplicate		1.30	1.38	6	6	
↓	ICP serial dilution	↓	2.49	2.62	5	5	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12682B4
SDG #: K24074J

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MW
2nd reviewer: [signature]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
(Y) N N/A Are all detection limits below the CRDL?

Detected analyte results for 1 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

$$As = \frac{7.963\ ug/L \times 0.1\ L \times 5}{0.645 \times 1.41\ g} = 4.38\ ug/g$$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (ug/kg)	Acceptable (Y/N)
1	As	4.38	4.38	Y

RECALC.4S2

LDC #: 12691A4
SDG #: K2406170
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II / IV

Date: 11/9/04
Page: 1 of 1
Reviewer: MH
2nd Reviewer: A

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/11 - 16/04
II.	Calibration	SW	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	A	
IX.	Furnace Atomic Absorption QC	N	Not Utilized
X.	ICP Serial Dilution	SW/A	
XI.	Sample Result Verification	A N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: See Worksheet

1	LDW-B2a-S	11		21		31	
2	LDW-B6a-S	12		22		32	
3	LDW-B4a-S	13		23		33	
4	LDW-B1a-S	14		24		34	
5	LDW-B9b-S	15		25		35	
6	LDW-B2a-SMS	16		26		36	
7	LDW-B2a-SDUP	17		27		37	
8	PD	18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 1269A4
SDG #: Kxfo6170

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: MR
2nd Reviewer:

Method: Metals (EPA SW 846 Method 6010/7000/6020)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Was a midrange cyanide standard distilled?			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
IV. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients ≥ 0.995?			✓	
Do all applicable analysies have duplicate injections?			✓	

LDC #: 12691 84
SDG #: K2406190

VALIDATION FINDINGS CHECKLIST

Page: 1 of 1
Reviewer: MM
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%?			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			
Were all percent differences (%Ds) ≤ 10%?		✓		
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		✓		
VIII. Internal Standards (EPA SW 846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 12691A4
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-5	Sediment	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN^-, ___ ___
6	↓	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN^-, ___ ___
↓ 7	↓	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, Pb, Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, Co, Cu, Fe, [✓ Pb], Mg, Mn, Hg, Ni, K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12691A4
SDG #: K24.6170

VALIDATION FINDINGS WORKSHEET
Calibration

Page: 1 of 1
Reviewer: MH
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

(Y) N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Y N (N/A) Was a midrange cyanide standard distilled?

(Y) N N/A Are all correlation coefficients ≥0.995?

(Y) N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data
1	10/11/04	CRDL	Cr	190 (70-130)	All	~~J (all detects) (>150%)~~
2	↓	CRDL	V	140 (70-130)	All	No qual (All > 2x CRDL)

Comments:

CAL.4SW

LDC #: 1269/A4
SDG #: K240619

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: MA
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: 500X (1g → 100 mL, 5X)
Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: All

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/~~CCB~~[a] (ug/L)	Blank Action Limit	Sample Identification: 4 X										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr															Cr
Co															Co
Cu															Cu
Fe															Fe
Pb															Pb
Mg															Mg
Mn															Mn
Hg															Hg
Nl															Nl
K															K
Se															Se
Ag			0.014	0.035											Ag
Na															Na
Tl			0.016	0.04	0.032										Tl
V															V
Zn															Zn
B															B
Mo			0.069	0.1725											Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

4 > CRDL. 5X rule.

LDC #: 12691A4
SDG #: K24061N0

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Page: 2 of 3
Reviewer: MW
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: 500X
Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: /

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ~~ICB/CCB~~[a] (ug/L)	Blank Action Limit	Sample Identification										
Al						No	Samples qualified								Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr															Cr
Co															Co
Cu															Cu
Fe															Fe
Pb															Pb
Mg															Mg
Mn															Mn
Hg															Hg
Nl															Nl
K															K
Se															Se
Ag			0.02	0.05											Ag
Na															Na
Tl			0.008	0.02											Tl
V															V
Zn															Zn
B															B
Mo			0.026	0.065											Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

LDC #: 1269A4
SDG #: K24617O

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: 50X
Sample Concentration units, unless otherwise noted: ug/kg Associated Samples: 2-5

Reviewer: MM
2nd Reviewer: [illegible]

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification: 4										
Al															Al
Sb															Sb
As			0.13	0.325											As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr															Cr
Co															Co
Cu															Cu
Fe															Fe
Pb			0.09	0.225											Pb
Mg															Mg
Mn															Mn
Hg															Hg
Ni															Ni
K															K
Se															Se
Ag			0.023	0.1575	0.046										Ag
Na															Na
Tl			0.008	0.02											Tl
V															V
Zn															Zn
B															B
Mo			0.057	0.1425											Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

* > CRDL, 5X rule

LDC #: 12691A4
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Reviewer: MY
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken. 0SPP limits

(Y) N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R MY	Associated Samples	Qualifications
1	6	Sediment	Sb	36 ~~(0-130)~~ (0-130)	A1	J/UJ/A (post spike) (12%)
2	No MS/Dup (non-client sample)	↓	Hg		A1	Text

Comments:

LDC #: 12691A4
SDG #: K24617o

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	1	Sediment	As	25	All ↓	J/UJ/A ↓
			Pb	13		

Comments:

SDIL.4S2

LDC #: 1269 | A4
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP (Initial calibration)	Co	1269	1250	102	102	Y
↓	~~GFAA~~ (Initial calibration) ICP/MS	Cd	25.19	25	101	101	↓
↓	CVAA (Initial calibration)	Hg	4.91	5.0	98	98	↓
CCV	ICP (Continuing calibration)	Zn	2472	2500	99	99	↓
↓	~~GFAA~~ (Continuing calibration) ICP/MS	Se	24.66	25	99	99	↓
↓	CVAA (Continuing calibration)	Hg	5.07	5.0	101	101	↓
	Cyanide (Initial calibration)						
	Cyanide (Continuing calibation)						

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CALCLC.4SW

LDC #: 12691 B4
SDG #: K240617O

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recaluculated using the following formula:

$$\%R = \frac{Found}{True} \times 100$$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$$\%D = \frac{|I-SDR|}{I} \times 100$$

Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
TCSAB	ICP interferance check	Ag	20.7	20	104	104	Y
LCS	Leboratory control sample	Tl	87.2	84.5	103	103	
6	Matrix spike	Mo	(SSR-SR) 100.3 ~~98.6~~ MM	1.09	92	92	
7	Duplicate	Ni	17.1	21.8	24	24	
1	ICP serial dilution	Pb	94.25	65.58	13	13	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

TCTCLC.4SW

LDC #: 1269A4
SDG #: K1606170

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MV
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for 1 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

$$Hg = \frac{0.88\ ug/L \times 0.1\ L}{2.06 \times 0.5} = 0.085\ ug/g$$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
1	Sb	0.56	0.56	Y
	As	9.26	9.26	
	Cd	0.214	0.214	
	Cr	27.4	27.4	
	Co	6.6	6.6	
	Cu	43.5	43.5	
	Pb	35.8	35.8	
	Hg	0.085	0.085	
	Mo	0.664	0.664	
	Ni	21.8	21.8	
	Se	0.7	0.74	
	Ag	0.285	0.285	
	Tl	0.094	0.094	
	V	48.1	48.1	
	Zn	103	103	✓

RECALC.4S2

LDC #: 12691B4

SDG #: K2406226

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/10/04

Page: 1 of 1

Reviewer: km

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/10, 13/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not Applicable
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B7b-S	11		21		31	
2	LDW-B3b-S	12		22		32	
3	PB	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 1269lB4
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MB
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1 2	Sediment	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, Pb, Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, Co, Cu, Fe, [✓ Pb], Mg, Mn, Hg, Ni, K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 1269/B4
SDG #: K2406276

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Reviewer: MY
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	LDW-B2a-SMS (SDG K2406276)	Sediment	Sb	36 (70-130)	All	J/UJ/A (post spike 42%)
		↓				
2	MS/Dup (from client)	↓	Hg ↓		All	Test.

Comments:

LDC #: 12691B4
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
Y N N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y N N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B20-S (SDG K2406170)	Sediment	As	25	All	J/UJ/A
			Pb	13	↓	↓

Comments:

SDIL.4S2

LDC #: 12691C4
SDG #: K2406296
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: mf
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18, 19/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	SR M
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B6b-S	11		21		31	
2	LDW-B8b-S	12		22		32	
3	LDW-B10b-S	13		23		33	
4	LDW-B6b-SMS	14		24		34	
5	LDW-B6b-SDUP	15		25		35	
6	PB	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12691C4
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-3	Sediment	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN^-, ___ ___
2,4,5	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___

		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, Pb, Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, Co, Cu, Fe, [✓ Pb], Mg, Mn, Hg, Ni, K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12691C4
SDG #: K240629b

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MY
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	LDW-B2a-SMS (SDG K2406170)	Sediment	Sb	36 (70-130)	All	J/UJ/A (post spike 112%)

Comments:

MS.4S2

LDC #: 1269 | C4
SDG #: K2406246

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B2a-S	Sediment	As	25	All	J/UJ/P
	(SDG K2406170)		Pb	13	J	↓

Comments:

SDIL.4S2

LDC #: 12691D4

SDG #: K2406519

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 11/10/04

Page: 1 of 1

Reviewer: MM

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26, 27/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	N	Mat reviewed
IX.	Furnace Atomic Absorption QC	N	Mat Wrkly
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B9a-S	11		21		31	
2	LDW-B3a-S	12		22		32	
3	LDW-B9a-SMS	13		23		33	
4	LDW-B9a-SDUP	14		24		34	
5	PB	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12691D4
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1, 2	Sediment	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN⁻, ___ ___
MS3,4	↓	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, Pb, Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, Co, Cu, Fe, [✓ Pb], Mg, Mn, Hg, Ni, K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻,

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12691D4
SDG #: K2406579

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MH
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	3	Sediment	Sb	34 (80-130)	All	J (all / A (post spike 110%))

Comments:

MS.4S2

LDC #: 12691D4
SDG #: K2406579

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	1	Sediment	As	23	All	J/UJ/A

Comments:

LDC #: 12691E4
SDG #: K2406580
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/1/19
Page: 1 of 1
Reviewer: VM
2nd Reviewer: A

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30 & 31
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	N	not reviewed
IX.	Furnace Atomic Absorption QC	N	not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B7a-S	11		21		31	
2	pB	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 1269/E4
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	Sediment	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, Pb, Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, Co, Cu, Fe, [✓ Pb], Mg, Mn, Hg, Ni, K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻,

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 1269I64
SDG #: KX40 6080

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MW
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	LDW-B2a-SMS (SDG KX40 6170)	Sediment	Sb	36 (80-130)	All	J/UJ/A (post spike 42%)
2	WS MS/Dup (WW client)	↓	Hg		All	Text.

Comments:

MS4S2

LDC #: 1269|E4
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MH
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B2a-S	Sediment	As	2*	A1)	J/UJ/A
	(SDG K2406170)		Pb	13	J	✓

Comments:

SDIL.4S2

LDC #: 12691F4
SDG #: K2407012
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: mm
2nd Reviewer: [signature]

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/17, 25/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	N	ht berylium
IX.	Furnace Atomic Absorption QC	N	ht thallium
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment.

1	LDW-B8a-S	11		21		31	
2	LDW-B10a-S	12		22		32	
3	LDW-B8a-SMS	13		23		33	
4	LDW-B8a-SDUP	14		24		34	
5	PB	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12691F4
SDG #: K2409012

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MG
2nd reviewer: _____

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1, 2	Sediment	Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN⁻, ___ ___
1,2,4	〃	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr], [✓ Co], [✓ Cu], Fe, Pb, Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, Co, Cu, Fe, [✓ Pb], Mg, Mn, Hg, Ni, K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12691F4
SDG #: K240612

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MY
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	LDW-B2a-SMS (SDG K240612)	Sediment	Sb	36 (80-130)	All	J/UJ/A (post spike 112%)
2	3	Sediment	Hg	147 (55-130)	All	J+ det /A

Comments:

MS.4S2

LDC #: 1269 I T4
SDG #: K2406012

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A'.

(Y) N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B2a-S	Sediment	As	25	All	J/UJ/A
	(SDG K2406170)		Pb	13	J	↓

Comments:

SDIL.4S2

LDC #: 12734B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 4/10/04
SDG #: K2407473 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: km
2nd Reviewer: A

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/21/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	N	not reviewed
IX.	Furnace Atomic Absorption QC	N	not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Sediment

1	LDW-B5a-S	11		21		31	
2	LDW-B5a-SMS	12		22		32	
3	LDW-B5a-SDUP	13		23		33	
4	PB	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12734B4
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: ✓

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	Sediment	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN⁻, ___ ___
2,3	↓	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr, Co, Cu], Fe, Pb, Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, [✓ V, Zn], Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, Co, Cu, Fe, [✓ Pb], Mg, Mn, Hg, Ni, K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻,

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 12734B4
SDG #: K2404473

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MH
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

(Y) N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken. Dapp limit

Y (N) N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	1	Sediment	Sb	51 (70-130)	All	J- / Hj / A (post spike was not performed on client sample)
2	No MS/Dup (non-client)	Sediment	Hg		All	& Text

Comments:

MS4S2

LDC #: 12734B4
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualificaticns below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Analyte	RPD (~~Limits~~ ≤30)	Difference (Limits)	Associated Samples	Qualifications
1	3	Sediment	As	34		All	J/UJ/A
		↓	Mo	8		↓	↓
			Ag	39			

Comments:

LDC #: 12734134
SDG #: K24-1473

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer: A

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	1	Sediment	As	15	A1	J/UJ/A

Comments:

SDIL.4S2

LDC #: 12734C4
SDG #: K2407595
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

METHOD: Metals (EPA SW 846 Method 6010B/6020/7000)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27, 28/04
II.	Calibration	N	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	N	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)		
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment.

1	LDW-B1b-S	11		21		31	
2	LDW-B2b-S	12		22		32	
3	LDW-B4b-S	13		23		33	
4	LDW-B5b-S	14		24		34	
5	LDW-B1b-SMS	15		25		35	
6	LDW-B1b-SDUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12934C4
SDG #: K2407595

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-4	Sediment	Al, [✓ Sb, As], Ba, Be, [✓ Cd], Ca, [✓ Cr, Co, Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl], [✓ V], [✓ Zn], [✓ Mo], B, Si, CN^-, ___ ___
&5,6	✓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, [✓ Cr, Co, Cu], Fe, Pb, Mg, Mn, Hg, [✓ Ni], K, Se, Ag, Na, Tl, [✓ V], [✓ Zn], Mo, B, Si, CN^-, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
ICP-MS		Al, [✓ Sb], [✓ As], Ba, Be, [✓ Cd], Ca, Cr, Co, Cu, Fe, [✓ Pb], Mg, Mn, Hg, Ni, K, [✓ Se], [✓ Ag], Na, [✓ Tl], V, Zn, [✓ Mo], B, Si, CN^-, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___

Comments: Mercury by CVAA if performed

LDC #: 12734c4
SDG #: K2409595

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Reviewer: MY
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken. (APP limits)

Y (N) N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	LDW-BSA-S (SDG K2409473)	Sediment	Sb	51 (70-130)	All	J- (all J/A (post spike was performed on a non client sample)

Comments:

LDC #: 12934 c4
SDG #: K240595

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Analyte	RPD (Limits) ≤30	Difference (Limits)	Associated Samples	Qualifications
1	LDW-BSq-S	Sediment	As	34		All	J/UJ/A
	(SDG K240433)		Mo	81		↓	↓
			Ag	39			

Comments:

DLP.4S2

LDC #: 12734C4
SDG #: K240595

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: MH
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	LDW-B5a-S	Sediment	As	15	All	J/UJ/A
	(SDG K240794R3)					

Comments:

LDC #: 12631A6
SDG #: K2406516
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/9/04
Page: 1 of 1
Reviewer: km
2nd Reviewer:

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 - 27/04
IIa.	Initial calibration	N	Not reviewed for Level II validation.
IIb.	Calibration verification	N	Not reviewed for Level II validation.
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	3 MS/Dup + (Triplicate)
V	Duplicates	A ~~SW~~	
VI.	Laboratory control samples	A	LCS
VII.	Sample result verification	N	Not reviewed for Level II validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	~~SW~~ N	~~(2,3), (6,8), (7,11), (12,13)~~ R
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Sediment

1	LDW-C4-S	11	LDW-C3-S1	21		31	
2	LDW-C10-S2	12	LDW-C2-S1	22		32	
3	LDW-C10-S1	13	LDW-C2-S2	23		33	
4	LDW-C6-S	14	LDW-C1-S	24		34	
5	LDW-C9-S	15	LDW-C4-SMS	25		35	
6	LDW-C7-S1	16	LDW-C4-SDUP	26		36	
7	LDW-C3-S2	17	LDW-C4-STRP	27		37	
8	LDW-C7-S2	18	MRS	28		38	
9	LDW-C8-S	19		29		39	
10	LDW-C5-S	20		30		40	

Notes:

12631A6W.wpd

380

LDC #: 12631A6
SDG #: K240651

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MH
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-14	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (Particle Size) ____ ____ ____
on 15	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} ____ ____ ____ ____
16	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (Particle Size) ____ ____
17	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC

LDC #: 12691A6
SDG #: K2406170
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/9/04
Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/11 – 16/04
IIa.	Initial calibration	A ~~N~~	
IIb.	Calibration verification	A ~~N~~	
III.	Blanks	A	N.T requires for particle size.
IV	Matrix Spike/Matrix Spike Duplicates	~~N~~ A	N.T requires for Particle size.
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	A	LCS, N.T requires for Particle size
VII.	Sample result verification	A ~~N~~	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B2a-S	11		21		31	
2	LDW-B6a-S	12		22		32	
3	LDW-B4a-S	13		23		33	
4	LDW-B1a-S	14		24		34	
5	LDW-B9b-S	15		25		35	
6	LDW-B2a-SDUP	16		26		36	
7	LDW-B2a-STRP	17		27		37	
8	ND	18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 11691A6
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MH
2nd Reviewer:

Method: Inorganics (EPA Method PSEP)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.				
Cooler temperature criteria was met.				
II. Calibration				
Were all instruments calibrated daily, each set-up time?				
Were the proper number of standards used?				
Were all initial calibration correlation coefficients ≥ 0.995?				
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?				
Were titrant checks performed as required?				
Were balance checks performed as required?				
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
III. Blanks				
Was a method blank associated with every sample in this SDG?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in thie SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.				
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL (≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.				
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?				
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				

LDC #: 1269A6
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Reviewer: MR
2nd Reviewer: JC

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
Were detection limits < RL?				
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.				
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.				
Target analytes were detected in the field duplicates.				
X. Field blanks				
Field blanks were identified in this SDG.				
Target analytes were detected in the field blanks.				

LDC #: 1269186
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-5	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN [✓ TOC] CR^{6+} [✓ Particle size] ____ ____
m 6.7	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}

Comments:

METHODS.6

LDC #: 12691 S6
SDG #: k2f0619

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MH
2nd Reviewer: A

METHOD: Inorganics, Method 851-P

The correlation coefficient (r) for the calibration of _____ was recalculated. Calibration date: _____

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte		_____(units)	_____ (units)	Recalculated r or %R	Reported r or %R	Acceptable (Y/N)
Initial calibration		Blank					
Calibration verification		Standard 1					
		Standard 2					
		Standard 3					
		Standard 4					
	MH	Standard 5					
		Standard 6					
		Standard 7					
Calibration verification CCV3	Toc	20	18.95		95	95	Y
Calibration verification CCV4	Toc	20	20.4		102	102	Y
Calibration verification							

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CALCLC.6

LDC #: 12691A6
SDG #: KX4GL1

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MH
2nd Reviewer:

METHOD: Inorganics, Method ICP

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	TOC	0.81	0.75	108	108	Y
KX4GBM6	Matrix spike sample	TOC	(SSR-SR) 3.28	3.48	94	94	↓
KX4GBX6-01	Duplicate sample	TOC	1.32	1.26	5	5	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 1269I A6
SDG #: 480617

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MH
2nd reviewer: A

METHOD: Inorganics, Method PSEP

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for _____ reported with a positive detect were recalculated and verified using the following equation:

Concentration =

$$\%\,TOC = \frac{(\text{Instr Reading}) \times (0.1)}{\text{mg Sample Injected}}$$

Recalculation:

$$\% = \frac{(579.7 - 7.8) \times 0.1}{29.1}$$

$$= 1.9653\,\%$$

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
1	1	TOC (%)	1.97	1.97	Y
		Particle Size (Description)			
1	1	Gravel (% Wt. percent)	0.93	0.93	Y
		Very Coarse Sand	0.62	0.62	
		Coarse Sand	2.91	2.91	
		Medium Sand	9.21	9.20	
		Fine Sand	14.8	14.8	
		Very Fine Sand	28.1	28.1	
		62.5 um	21.5	21.5	
		31.3 um	8.39	8.37	
		15.6 um	6.25	6.25	
		7.8 um	3.82	3.82	
		3.9 um	3.37	3.37	
		1.95 um	0.98	0.98	
		0.98 um	3.25	3.25	

Note: _____

LDC #: 12691B6
SDG #: K2406226
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/10-13/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	Mit required for particle.
IV	Matrix Spike/Matrix Spike Duplicates	A	MS for TOC, Mit required for Particle Size
V	Duplicates	A	Triplicates,
VI.	Laboratory control samples	A	LCS, Mit required for particle
VII	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B7b-S	11		21		31	
2	LDW-B3b-S	12		22		32	
3	LDW-B7b-SMS	13		23		33	
4	LDW-B7b-SDUP	14		24		34	
5	LDW-B7b-STRP	15		25		35	
6	MB	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 1269|B6
SDG #: K2406276

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MH
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter			
1, 2	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (Particle Size)	____	____	____
or 3	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+}	____	____	____
↓ 4, 5	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+}	____	____	____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC

LDC #: 12691C6
SDG #: K2406296
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/18, 19/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	Not required for particle size
IV	Matrix Spike/Matrix Spike Duplicates	A	MS for TOC, Not required for particle size
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	A	LCS, Not required for particle size
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B6b-S	11		21		31	
2	LDW-B8b-S	12		22		32	
3	LDW-B10b-S	13		23		33	
4	MB	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12691C6
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1-3	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN [✓ TOC] CR^{6+} [✓ Particle Size] ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}

Comments:

LDC #: 12691D6
SDG #: K2406519
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/26, 9/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	Not required for particle size
IV	Matrix Spike/Matrix Spike Duplicates	A	MS from SDG K2406326, not required for particle size
V	Duplicates	A	triplicates
VI.	Laboratory control samples	A	LCS, not required for particle size.
VII	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	P	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B9a-S	11		21		31	
2	LDW-B3a-S	12		22		32	
3	MB	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 1269|D6
SDG #: K24065|9

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MH
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1,2	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (Particle Size) ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____

LDC #: 12691E6
SDG #: K2406580
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: MH
2nd Reviewer: [illegible]

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/30/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	Mit required for particle size
IV	Matrix Spike/Matrix Spike Duplicates	A	MS: K2406226, Mit required for particle size.
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	A	LCS, Mit required for particle size
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	LDW-B7a-S Sediment	11		21		31	
2	MB	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 1269 | E6
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN [✓ TOC] CR^{6+} [✓ Particle Size] ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}

Comments: ______________________________

LDC #: 12691F6
SDG #: K2407012
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: MM
2nd Reviewer: [signature]

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/16 - 25/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	Not required for particle size.
IV	Matrix Spike/Matrix Spike Duplicates	A	MS: K2406226, Not required for particle
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	A	LCS, Not required for particle size
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B5a-S	11		21		31	
2	LDW-B8a-S	12		22		32	
3	LDW-B10a-S	13		23		33	
4	MB	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 1269 | F6
SDG #: K240012

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
2,3	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (Particle Size) ____ ____ ____
1	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC

LDC #: 12734B6
SDG #: K2407473
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: MH
2nd Reviewer:

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	N.t required for particle size
IV	Matrix Spike/Matrix Spike Duplicates	A	MS for TOC. N.t required for particle size
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	A	LCS. N.t required for particle size
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B5a-S	11		21		31	
2	LDW-B5a-SMS	12		22		32	
3	LDW-B5a-SDUP	13		23		33	
4	LDW-B5a-STRP	14		24		34	
5	~~X~~ MB	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 12734B6
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET

Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MH
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN [✓ TOC] CR^{6+} [✓ particle size] ___ ___ ___
or 2	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN [✓ TOC] CR^{6+} ___ ___ ___ ___
3,4	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN [✓ TOC] CR^{6+} [✓ particle size] ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ___ ___ ___ ___
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+}

Comments:

LDC #: 12734C6
SDG #: K2407595
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/10/04
Page: 1 of 1
Reviewer: MJ
2nd Reviewer: [illegible]

METHOD: TOC (PSEP), Particle Size (Method PSEP)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27/04, 9/28/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	Not required for particle size
IV	Matrix Spike/Matrix Spike Duplicates	A	
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	A	LCS. Not required for particle size
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1	LDW-B1b-S	11		21		31	
2	LDW-B2b-S	12		22		32	
3	LDW-B4b-S	13		23		33	
4	LDW-B5b-S	14		24		34	
5	MB	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 17134c6
SDG #: K1407855

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MH
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1-4	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} Particle size ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____

LDC #: 12631A19
SDG #: K2406516
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II~~/IV~~

Date: 10/20/0
Page: 1 of
Reviewer:
2nd Reviewer:

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/25 → 8/27/04
IIa.	Initial calibration	~~N~~A	Not reviewed for Level II validation.
IIb.	Calibration verification	~~N~~A	Not reviewed for Level II validation. ICV ± 25 CCV ± 25
III.	Blanks	~~A~~A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates /DUP	SW/A	
IVc.	Laboratory control samples /SRM	A	
V.	Target compound identification	~~N~~A	Not reviewed for Level II validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level II validation.
VII.	System Performance	A	Not reviewed for Level II validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	~~SW~~ N	D = 1+2+3, 2+3, 6+8, 7+
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ~~* Indicates sample underwent Level IV validation~~ Sediments

1	LDW-C4-S*	11	LDW-C3-S1*	21	KWG0413046-5	31	
2	LDW-C10-S2*	12	LDW-C2-S1*	22		32	
3	LDW-C10-S1	13	LDW-C2-S2*	23		33	
4	LDW-C6-S*	14	LDW-C1-S*	24		34	
5	LDW-C9-S*	15	LDW-C9-SMS	25		35	
6	LDW-C7-S1	16	LDW-C9-SMSD	26		36	
7	LDW-C3-S2*	17	LDW-C2-S2DUP	27		37	
8	LDW-C7-S2*	18		28		38	
9	LDW-C8-S	19		29		39	
10	LDW-C5-S*	20		30		40	

Notes:

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408

LDC #: 12631A19
SDG #: K24065/6

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Page: 1 of 1
Reviewer: RT
2nd Reviewer: [illegible]

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ SRM amount w/ acceptable limits

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	No SRM was analyzed for (Tetra-n-Butyltin					All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			SRM = standard (reference material				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 1263A19
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: R
2nd Reviewer: el

METHOD: [✓ GC] __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y [✓ N] N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	15&16	n Butyltin	13 (20-130)	( )	( )	#5	J/UJ/A
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12691A19
SDG #: K2406170
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level ~~III~~ IV

Date: 11/09/04
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/11 → 8/16/04
IIa.	Initial calibration	~~A~~ N	%RSD ≤ 20
IIb.	Calibration verification	~~A~~ N	% D ≤ 25
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates / DUP	SW/A	
IVc.	Laboratory control samples / SRM	A/A	LCS
V.	Target compound identification	~~A~~ N	
VI.	Compound Quantitation and CRQLs	~~A~~ N	
VII.	System Performance	~~A~~ N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1 †	LDW-B2a-S	11	KWG0414228-5	21		31	
2 †	LDW-B6a-S	12		22		32	
3 †	LDW-B4a-S	13		23		33	
4 †	LDW-B1a-S	14		24		34	
5 †	LDW-B9b-S	15		25		35	
6	LDW-B1a-SMS	16		26		36	
7	LDW-B1a-SMSD	17		27		37	
8	LDW-B1a-SDUP	18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12691A19
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Reviewer: BZ
2nd Reviewer: [illegible]

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or %R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ ~~15%~~ 25.0 or percent recoveries ~~85-115%~~ 75-125?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			

LDC #: 12691 A19
SDG #: K2406170

VALIDATION FINDINGS CHECKLIST

Reviewer: EF
2nd Reviewer: AC

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds idetected in the field duplicates?			✓	
XV. Field blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	

LDC #: 12691A19
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: F7
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All	cooler	temp	= 11.0°C				J/UJ/Acc Ext

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 12691A19
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	5+6	n-Butyltin	4 (20-130)	( )	128 (50)	4	J/UJ/A
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12691A19
SDG #: K2406170

METHOD: ✓ GC ___ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS~~ percent recoveries (%R) and relative percent differences (RPD) within the QC limits?
SRM amount w/ acceptable limits

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	No SRM was analyzed for (Tetra-n-Butyltin					All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	SRM = standard (reference (material						
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 1269A19
SDG #: K240617D

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC ____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (50 std)	Recalculated CF (50 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	CAL3856 GC26 RTX-1	9/24/04	Tetra-n-butyltin	84100	84100	82000	82000	5.7	5.7
2	RTX-35	9/24/04	↓	54800	54800	56200	56200	6.7	6.7
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

INIC[illegible]SB

LDC #: 1269A19
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: JT
2nd Reviewer: GK

METHOD: GC ✓ HPLC ____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	0928F019	9/28/04	Tetra-n-butyltin	82000	85600	85600	4	4
	RTX-1							
2	RTX-35	↓	↓	56200	57700	57700	3	3
3	0928F035	9/28/04	↓	82000	87300	87300	6	6
	RTX-1							
4	RTX-35	↓	↓	56200	59400	59400	6	6

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 1269A19
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:
2nd Reviewer:

METHOD: GC / HPLC

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	100F015	10/1/04	Tetra-n-butyltin	82000	89900	89900	10	10
	RTX-1							
2	RTX-35	10/1/04	↓	82200	61100	61100	9	9
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CONCLC.1S

LDC #: 12691A19
SDG #: F2406170

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC / HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tri-n-propyltin	RTX-35	125	121.84	97	97	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

SURRCALCNew.wpd

LDC #: 12691A19
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FF
2nd Reviewer: DC

METHOD: __GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 6 + 7

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Tetra-butyltin	31.0	31.0	0.23	26.4	28.2	85.0	85	91	90	7	7

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691A19
SDG #: 1C2406170

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ~~GC~~ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

Where SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: KWG0414228-4

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	---	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Tetra-n-butyltin	25.0	NA	~~17.3~~ 0	17.3	NA	69	69	NA			

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 12691A 19
SDG #: K2406170

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer:
2nd Reviewer:

METHOD: ___ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #1 Compound Name Tri-n-butyltin

Concentration = $\frac{4576849 \text{ ug} \times 4 \text{ ml} \times 1 \quad \times 1000}{8290 \text{ ml} \quad L \quad 20.11 \text{ g} \quad 0.50}$

= 22 ug/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments:

SAMPCALew.wpd

LDC #: 12691B19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/8/04
SDG #: K2406226 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/10 - 8/13/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates /DMP	SW/A	LDW-B1a -5 MS/MSD + DUP
IVc.	Laboratory control samples /SRM	A SW	LCS
V.	Target compound identification	A	
VI.	Compound Quantitation and CRQLs	SW	
VII.	System Performance	N	
VIII.	Overall assessment of data	SW	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B7b-S 13	11		21		31	
2	LDW-B3b-S 10	12		22		32	
3	LDW-B3b-SDL	13		23		33	
4	KWG0414228-5	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12691B19
SDG #: K2406226

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits~~? SRM amount w/ acceptable limits

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	NO SRM was analyzed for Tetra-n-Butyltin		( )	( )	( )	All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	SRM = standard reference material		( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12691B19
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: B
2nd Reviewer: R

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	LDW-Blq-SMS/MSD	n-Butyltin	4 (20-130)	~~84 (20-130)~~	128 (50)		no QUAL no Ass. Sample
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 1269B19
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: / GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Tri-n-butyltin	exceeded cal range	2	J/A det
	Di-n-butyltin	↓	↓	↓
	n-Butyltin	↓	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12691B19
SDG #: K2406226

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: / GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	Tetra-n-butyltin	result is lower	2	R/A
	Tri-n-butyltin	Exceeded cal range	2	R/A
	Di-n-butyltin	↓	↓	↓
	n-Butyltin	↓	↓	↓
	(All cpds)			

Comments: _____

LDC #: 12691C19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/08/04
SDG #: K2406296 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer:
2nd Reviewer:

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/12 – 8/19/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	SW	LDW-B7a-S MS/MSD + DUP
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B6b-S 18	11	KWG0414230-5	21		31	
2	LDW-B8b-S 19	12		22		32	
3	LDW-B10b-S 19	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 1269/C19
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	LDW-B79-S MS/	n-Butyltin	12 (20-130)	( )	( )		No QUAL
	MSD		( )	( )	( )		No Assoc.
			( )	( )	( )		sample
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		

LDC #: 12691C19
SDG #: K2406296

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?
Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 50 ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B7a-SDUP	sediment	n-Butyltin	69		No qual no associated sample

Comments: _____

DUPNew.wpd

LDC #: 12691C19
SDG #: K2406296

METHOD: ✓ GC ___ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Reviewer: EC
2nd Reviewer: EC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

X/N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y/N N/A Were the ~~LCS~~ percent recoveries (%R) and relative percent differences (RPD) within the QC limits?
SRM amount w/ acceptable limits

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	No SRM was analyzed for (Tetra-n-Butyltin					All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			SRM = standard (reference (material				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		

LDC #: 12691D19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/08/0
SDG #: K2406519 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A ~~SW~~	Sampling dates: 8/26 - 8/27/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates / DUP	~~SW~~ SW	LDW-B7a-S MS/MSD + DUP
IVc.	Laboratory control samples / SRM	A/SW	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Sediment

1	LDW-B9a-S 27	11		21		31	
2	LDW-B3a-S 26	12		22		32	
3	KWG0414230-5	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12691D19
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 13
2nd Reviewer: 8

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	LDW-B7a-S	n-Butyltin	12 (20-130)	( )	( )		no Qual
			( )	( )	( )		no Associated
			( )	( )	( )		sample
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 12691D19
SDG #: K2406519

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B7q-S DUP	sediment	n-Butyltin	69 (50)	~~LDW-B~~ LDW-B7q-S	no Qual no Associated sample

Comments: _____

DUPNew.wpd

LDC #: 12691D19
SDG #: K2406519

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Reviewer: [illegible]
2nd Reviewer: [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS~~ percent recoveries (%R) and relative percent differences (RPD) within the QC limits?
SRM amount w/ acceptable limits

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	NO SRM was analyzed for (Tetra-n-Butyltin					All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			SRM = standard (reference (material				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12691E19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/08/0
SDG #: K2406580 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 1
2nd Reviewer: 2

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/30/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates DUP	SW SW	~~LDW-B7a-S MS/MSD & DUP~~
IVc.	Laboratory control samples SRM	A/SW	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B7a-S 8/30	11		21		31	
2	LDW-B7a-SMS	12		22		32	
3	LDW-B7a-SMSD	13		23		33	
4	LDW-B7a-SDUP	14		24		34	
5	KWG0414230-5	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12691E19
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		2+3	n Butyltin	12 (20-130	( )	( )		J/UJ/A
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 12691E19
SDG #: K2406580

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ____ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	4	sediment	n-Butyltin	69 (50)	1	~~J/UJ/A~~ no qual
	n-Butyltin	6.0 J	4.1 ug/kg	2.0 = R.L	< 5X RL	

Comments: _____

DUPNew.wpd

LDC #: 12691E19
SDG #: K2406580

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Reviewer: [illegible]
2nd Reviewer: [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits~~? SRM amount w/ acceptable limits

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
	NO SRM was analyzed for (Tetra-n-Butyltin					All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			SRM = standard (reference material				
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12691F19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/8/04
SDG #: K2407012 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A SW	Sampling dates: 8/17 → 8/25/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates DUP	SW SW	LDW-B19-S MS/MSD +DUP
IVc.	Laboratory control samples SRM	A/SW	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

sediment

1	LDW-B8a-S 8/17	11		21		31	
2	LDW-B10a-S 8/25	12		22		32	
3	KWG0414230-5	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12691P19
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LDW-B7a-S MS/	n-Butyltin	12 (20-130)	( )	( )		no QUAL no
		MSD		( )	( )	( )		associated
				( )	( )	( )		Sample
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

LDC #: 12691F19
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ ___ ?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Compound	%RPD (Limits)	Associated Samples	Qualifications
	LDW-B7a-SDup	Sediment	n Butyltin	69 (50)	LDW-B7a-S ~~Dup~~	no Sn A2 associated sample not in this SDG

Comments: _____

DUPNew.wpd

LDC #: 12691F19
SDG #: K2407012

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~ SRM

Reviewer: [illegible]
2nd Reviewer: [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

X N N/A Were a laboratory control samples (~~LCS~~) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the ~~LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?~~ SRM amount w/ acceptable limits

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	NO SRM was analyzed for (Tetra-n-Butyltin		( )	( )	( )	All	Text
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	SRM = standard (reference (material		( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12734B19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/04
SDG #: K2407473 Level II Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/24/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates /DUP	A/A	LDW-B5b-S MS/MSD and lab DUP
IVc.	Laboratory control samples /SRM	A/SW	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: sediment

1	LDW-B5a-S	11		21		31	
2	KWG0415330-5	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12734B19
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET

~~Laboratory Control Samples (LCS)~~

SRM

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N (N/A) Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N (N/A) Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N (N/A) Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
			( )	( )	( )		
	SRM	NO	SRM (was	analyzed)	for ( )	All + BlK	Text
			Tetra-n-Butyltin	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 12734C19
SDG #: K2407595
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level II

Date: 11/15/04
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 9/27 - 9/28/04
IIa.	Initial calibration	N	
IIb.	Calibration verification	N	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates /DUP	A/A	
IVc.	Laboratory control samples /SRM	A/SW	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	SW	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Sediment

1 +	LDW-B1b-S	11	KWG0415330-5 +	21		31	
2 +	LDW-B1b-SDL	12		22		32	
3 +	LDW-B2b-S	13		23		33	
4 +	LDW-B4b-S	14		24		34	
5 +	LDW-B5b-S	15		25		35	
6	LDW-B5b-SMS	16		26		36	
7	LDW-B5b-SMSD	17		27		37	
8	LDW-B5b-SDUP	18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 12734C19
SDG #: K2407595

METHOD: ✓ GC __ HPLC

VALIDATION FINDINGS WORKSHEET
~~Laboratory Control Samples (LCS)~~
SRM

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
			( )	( )	( )		
			( )	( )	( )		
	SRM	No	SRM was	analyzed for	( )	All + BlK	Text
			Tetra-n-Butyltin	)	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LCSNew.wpd

LDC #: 12734C19
SDG #: K240759S

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer:
2nd Reviewer:

METHOD: GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level IV/D Only
Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Tri-n-butyltin,	exceeded cal range	#1	Jdet/A
	Di-n-butyltin	↓	↓	↓
	Tri-n-butyltin	↓	#2	Jdet/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 12734C19
SDG #: K2407595

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	Tri-n-butyltin,	exceeded cal range	#1	R/A
	Di-n-butyltin			
	n-Butyltin	lower result	#1	R/A
	Tetra-n-butyltin	diluted	#2	R/A

Comments: _____

Attachment C-3: DDT Confirmation Analyses – Tissue

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

LDC #13012
January 24, 2005

Windward Environmental, LLC
200 West Mercer Street, Suite 401
Seattle, WA 98119
ATTN: Ms. Susie McGroddy

SUBJECT: Lower Duwamish Waterway Group Tissue Sample Data Validation

Dear Ms. McGroddy,

Enclosed is our EPA Level IV data validation of analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The analyses were performed by Columbia Analytical Services, Inc. Chlorinated Pesticide results were confirmed by GC/MS EPA SW846 Method 8270C. Samples are referenced under the following Sample Delivery Groups: K2406932 and K2407452. See the Sample Analysis Table (Attachment 1) for the number of samples reviewed and the Sample Validation Table (Attachment 2) for the sample identifications and analyses.

Please feel free to contact us if you have any questions.

Sincerely,

Stella S. Cuenco
Project Manager/Senior Chemist

Attachment 1

Job #04-08-06-21 LDC #13012 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	Pest. (8270C)																															
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406932	01/12/05	01/26/05	1	0																														
B	K2407452	01/12/05	01/26/05	1	0																														
Total	B			2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

Attachment 2

SDG#: K2406932 VALIDATION SAMPLE TABLE **LDC#:** 13012A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-38a-T	K2406932-006	tissue	08/17/04	X											

Note: X = Validation was performed.

Attachment 2

SDG#: K2407452 VALIDATION SAMPLE TABLE **LDC#:** 13012B

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-35a-T	K2407452-001	tissue	09/24/04	X											

Note: X = Validation was performed.

ADDENDUM TO THE
CHEMICAL DATA QUALITY REVIEW FOR TISSUE SAMPLES

Lower Duwamish Waterway Group
LDC# 13012

This report details the findings of an EPA Level IV data validation review of Analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The analyses were performed by Columbia Analytical Services, Inc. Chlorinated Pesticide results were confirmed by GC/MS EPA SW 846 Method 8270C. Samples are referenced under the following Sample Delivery Groups: K2406932 and K2407452. See the Sample Analysis Table (Attachment 1) for the number of samples reviewed and the Sample Validation Table (Attachment 2) for the sample identifications and analyses.

The QC guidelines used for data qualification are those specified in the National Functional Guidelines for Organic Data Review (October 1999). Specific QC criteria used follows the Final Benthic Invertebrate Sampling of the Lower Duwamish Waterway Quality Assurance Project Plan (July 30, 2004). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The following items were evaluated during the review:

- Holding Times
- Instrument Calibration
- Blanks
- Internal Standards
- Target Compound Identifications
- Compound Quantitation and CRQLs
- System Performance

Only issues which require comment or action are discussed in this report. Data deficiencies are arranged by method. Potential effects of data anomalies have been described where possible.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

Attachment 1

Job #04-08-06-21 **LDC #13012 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)**

LDC	SDG#	DATE REC'D	DATE DUE	Pest. (8270C)																															
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406932	01/12/05	01/26/05	1	0																														
B	K2407452	01/12/05	01/26/05	1	0																														
Total	B			2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

13012ST.wpd

Attachment 2

SDG#: K2406932 VALIDATION SAMPLE TABLE **LDC#:** 13012A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-B8a-T	K2406932-006	tissue	08/17/04	X											

Note: X = Validation was performed.

Attachment 2

SDG#: K2407452 VALIDATION SAMPLE TABLE **LDC#:** 13012B

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-B5a-T	K2407452-001	tissue	09/24/04	X											

Note: X = Validation was performed.

Overall Data Assessment

Holding time exceedances have warranted the qualification of all samples in this data set.

Based upon the information reviewed, the overall data quality is considered acceptable with the noted limitations.

GC/MS Chlorinated Pesticides by EPA SW 846 Method 8270C

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Associated SDG	Sample	Compound	Total Days From Sample Extraction Until Analysis	Required Holding Time (in Days) From Sample Extraction Until Analysis	Flag	A or P
K2406932	LDW-B8a-T	All TCL compounds	89	40	J (all detects) UJ (all non-detects)	A
K2407452	LDW-B5a-T	All TCL compounds	73	40	J (all detects) UJ (all non-detects)	A

Although the analysis holding time was grossly exceeded (>2X) for sample LDW-B8a-T, results were qualified as estimated "J/UJ". GC/MS confirmation analyses were performed for qualitative identification only.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

Average relative response factors (RRF) for all target compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks performed in the pesticide analyses (Method 8081A) .

VI. Internal Standards

All internal standard areas and retention times were within QC limits.

VII. Target Compound Identification

All target compound identifications were within validation criteria.

VIII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria.

IX. System Performance

The system performance was acceptable.

LDC #: 13012A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 1/13/05
SDG #: K2406932 Level IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: K
2nd Reviewer: A

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 3/17/04
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	8081A
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	A	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples

1	LDW-B8a-T	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 13012A2a
SDG #: K240693L

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: [illegible]
2nd Reviewer: R

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		✓		
Cooler temperature criteria was met.				
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓	✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	*			
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
VI. Surrogate spikes				
Were all surrogate %R within QC limits?				
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?				
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?				
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Was a MS/MSD analyzed every 20 samples of each matrix?				

LDC #: 13012A29
SDG #: K2406932

VALIDATION FINDINGS CHECKLIST

Page: 2 of 3
Reviewer: B
2nd Reviewer: DK

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?			✓	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?			✓	
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?			✓	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.			✓	
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 13012A2a
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: EF
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
Y / N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1	Tissue	frozen	8/17/04	9/29/04	12/27/04	89	J/R/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 13012A2a
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1000 std)	Recalculated RRF (1000 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	Restomation —1221	12/27/04	~~Phenol~~ 2,4-DCB (1st internal standard)	1.082	1.082	1.146	~~1.153~~ 1.146	5.04	~~5.186~~ 5.033
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13012A2a
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 5
2nd Reviewer: DC

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	1227010	12/27/04	~~Phenol~~ 2,4-DNP (1st internal standard)	1.146	not reported	1.12066	not reported	2.2
			Naphthalene (2rd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13012A2a
SDG #: K2406932

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. _____, _____:

Conc. = ( )( )( )( )( )
( )( )( )( )( )

= all ND

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

LDC #: 13012B2a **VALIDATION COMPLETENESS WORKSHEET** Date: 1/13/05
SDG #: K2407452 Level IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 9/24/04
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	8081A
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	A	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples

1	LDW-B5a-T	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 13012B29
SDG #: K2407452

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: B
2nd Reviewer: C

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	~	✓		
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
VI. Surrogate spikes				
Were all surrogate %R within QC limits?				
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?				
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?				
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Was a MS/MSD analyzed every 20 samples of each matrix?				

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniiine
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

COMPNDL.2S

LDC #: 13012B2a
SDG #: K240745

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer:
2nd Reviewer:

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1	Tissue	frozen	9/24/04	10/15/04	12/27/04	73	J/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 13012 B2a
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
averege RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1000 std)	Recalculated RRF (1000 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	~~Restworight~~ ICAL	12/27/05	~~Phenol~~ 2,4-DCE (1st internal standard)	1.082	1.082	1.146	1.146	5.04	5.04
			Naphthalene (2nd internal standard)						
			Flucrene (3rd internal standard)						
			Pentachloropherol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13012B2a
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	1227010	12/27/04	~~Phenol~~ 2,4-DCB (1st internal standard)	1.146	not reported	1.12066	not reported	2.2
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13012B2a
SDG #: K2407452

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #1, 4'-DDD

Conc. = $\frac{(28189)(2500)(\quad)(\quad)(\quad)(\quad)}{(1529424)(1.3810)(\quad)(\quad)(\quad)}$

= 33.39 ng/L × $\frac{4\,ml}{1.4\,l}$

= 95 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Attachment C-4: DDT Confirmation Analyses – Sediment

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

LDC #13011
January 24, 2005

Windward Environmental, LLC
200 West Mercer Street, Suite 401
Seattle, WA 98119
ATTN: Ms. Susie McGroddy

SUBJECT: Lower Duwamish Waterway Group Sediment Sample Data Validation

Dear Ms. McGroddy,

Enclosed is our EPA Level IV data validation of analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The analyses were performed by Columbia Analytical Services, Inc. Chlorinated Pesticide results were confirmed by GC/MS EPA SW846 Method 8270C. Samples are referenced under the following Sample Delivery Groups: K2406516, K2407012, and K2407473. See the Sample Analysis Table (Attachment 1) for the number of samples reviewed and the Sample Validation Table (Attachment 2) for the sample identifications and analyses.

Please feel free to contact us if you have any questions.

Sincerely,

Stella S. Cuenco
Project Manager/Senior Chemist

V:\LOGIN\Windward\Duwamish\13011COV.wpd

Attachment 1

Job #04-08-06-21 LDC #13011 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	DATE DUE	Pest. (8270C)																															
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406516	01/12/05	01/26/05	0	4																														
B	K2407012	01/12/05	01/26/05	0	1																														
C	K2407473	01/12/05	01/26/05	0	1																														
Total	B			0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

13011ST.wpd

Attachment 2

SDG#: K2406516 VALIDATION SAMPLE TABLE **LDC#:** 13011A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-C10-S2	K2406516-002	sediment	08/25/04	X											
LDW-C10-S1	K2406516-003	sediment	08/25/04	X											
LDW-C7-S1	K2406516-006	sediment	08/26/04	X											
LDW-C8-S	K2406516-009	sediment	08/26/04	X											

Note: X = Validation was performed.

13011VALA.wpd

Attachment 2

SDG#: K2407012 VALIDATION SAMPLE TABLE **LDC#:** 13011B

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-B8a-S	K2407012-006	sediment	08/17/04	X											

Note: X = Validation was performed.

13011VALB.wpd

Attachment 2

SDG#: K2407473 VALIDATION SAMPLE TABLE **LDC#:** 13011C

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-B5a-S	K2407473-001	sediment	09/24/04	X											

Note: X = Validaton was performed.

13011VALC.wpd

ADDENDUM TO THE
CHEMICAL DATA QUALITY REVIEW FOR SEDIMENT SAMPLES

Lower Duwamish Waterway Group
LDC# 13011

This report details the findings of an EPA Level IV data validation of analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The analyses were performed by Columbia Analytical Services, Inc. Chlorinated Pesticide results were confirmed by GC/MS EPA SW 846 Method 8270C. Samples are referenced under the following Sample Delivery Groups: K2406516, K2407012, and K2407473. See the Sample Analysis Table (Attachment 1) for the number of samples reviewed and the Sample Validation Table (Attachment 2) for the sample identifications and analyses.

The QC guidelines used for data qualification are those specified in the National Functional Guidelines for Organic Data Review (October 1999). Specific QC criteria used follows the Final Benthic Invertebrate Sampling of the Lower Duwamish Waterway Quality Assurance Project Plan (July 30, 2004). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The following items were evaluated during the review:

- Holding Times
- Instrument Calibration
- Blanks
- Internal Standards
- Target Compound Identifications
- Compound Quantitation and CRQLs
- System Performance

Only issues which require comment or action are discussed in this report. Data deficiencies are arranged by method. Potential effects of data anomalies have been described where possible.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

Attachment 1

Job #04-08-06-21 **LDC #13011 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)**

LDC	SDG#	DATE REC'D	DATE DUE	Pest. (8270C)																															
Matrix:	Tissue/Sediment			T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	T	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K2406516	01/12/05	01/26/05	0	4																														
B	K2407012	01/12/05	01/26/05	0	1																														
C	K2407473	01/12/05	01/26/05	0	1																														
Total	B			0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS/MSD, and DUPs

13011ST.wpd

Attachment 2

SDG#: K2406516 VALIDATION SAMPLE TABLE **LDC#:** 13011A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-C10-S2	K2406516-002	sediment	08/25/04	X											
LDW-C10-S1	K2406516-003	sediment	08/25/04	X											
LDW-C7-S1	K2406516-006	sediment	08/26/04	X											
LDW-C8-S	K2406516-009	sediment	08/26/04	X											

Note: X = Validation was performed.

13011VALA.wpd

Attachment 2

SDG#: K2407012 VALIDATION SAMPLE TABLE **LDC#:** 13011B

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-B8a-S	K2407012-006	sediment	08/17/04	X											

Note: X = Validation was performed.

13011VALB.wpd

Attachment 2

SDG#: K2407473 VALIDATION SAMPLE TABLE **LDC#:** 13011C

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-21

Client ID #	Lab ID #	Matrix	Date Collected	Pest. (8270C)											
LDW-B5a-S	K2407473-001	sediment	09/24/04	X											

Note: X = Validation was performed.

13011VALC.wpd

Overall Data Assessment

Holding time exceedances have warranted the qualification of all samples in this data set.

Based upon the information reviewed, the overall data quality is considered acceptable with the noted limitations.

GC/MS Chlorinated Pesticides by EPA SW 846 Method 8270C

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Associated SDG	Sample	Compound	Total Days From Sample Extraction Until Analysis	Required Holding Time (in Days) From Sample Extraction Until Analysis	Flag	A or P
K2406516	LDW-C10-S2 LDW-C10-S1	All TCL compounds	117	40	J (all detects) UJ (all non-detects)	A
K2406516	LDW-C7-S1 LDW-C8-S	All TCL compounds	118	40	J (all detects) UJ (all non-detects)	A
K2407012	LDW-B8a-S	All TCL compounds	95	40	J (all detects) UJ (all non-detects)	A
K2407473	LDW-B5a-S	All TCL compounds	70	40	J (all detects) UJ (all non-detects)	A

Although the analysis holding time was grossly exceeded (>2X) for samples LDW-C10-S2, LDW-C10-S1, LDW-C7-S1, LDW-C8-S and LDW-B5a-S, results were qualified as estimated "J/UJ". GC/MS confirmation analyses were performed for qualitative identification only.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

Average relative response factors (RRF) for all target compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks performed in the pesticide analyses (Method 8081A) .

VI. Internal Standards

All internal standard areas and retention times were within QC limits.

VII. Target Compound Identification

All target compound identifications were within validation criteria.

VIII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria.

IX. System Performance

The system performance was acceptable.

LDC #: 13011A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 1/13/05
SDG #: K2406516 Level IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/25 to 8/26/04
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	8081A
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	A	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples

1	LDW-C10-S2	11		21		31	
2	LDW-C10-S1	12		22		32	
3	LDW-C7-S1	13		23		33	
4	LDW-C8-S	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 13011A2a
SDG #: K2406516

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓	✓		
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
VI. Surrogate spikes				
Were all surrogate %R within QC limits?				
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?				
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?				
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Was a MS/MSD analyzed every 20 samples of each matrix?				

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?			✓	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?			✓	
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?			✓	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 13011A2a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

All circled dates have exceeded the technical holding times.
Y (N) N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1,2	sediment	frozen	8/25/04	~~12/2/10~~ 9/1/04	12/27/04	117	J/R/A UJ
3,4	↓	↓	8/26/04	9/1/04	12/28/04	118	J/R/A UJ

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

HT.2S

LDC #: 13011A2a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
$\%RSD = 100 * (S/X)$

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1000 std)	Recalculated RRF (1000 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	Pentachlorophenol	12/27/04	~~Phenol~~ 2,4 DDE (1st internal standard)	1.082	1.082	1.146	1.146	5.04	5.04
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13011A29
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration averege RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	1227010	12/27/04	~~Phenol~~ 2,4-DNE (1st internal standard)	1.146	not reported	1.12066	not reported	2.2
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CONCLC.2S

LDC #: 13011A2a
SDG #: K2406516

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. _____, _____:

Conc. = $\frac{(\quad)(\quad)(\quad)(\quad)(\quad)(\quad)}{(\quad)(\quad)(\quad)(\quad)(\quad)(\quad)}$

= all ND

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

RECALC.2S

LDC #: 13011B2a **VALIDATION COMPLETENESS WORKSHEET** Date: 1/13/05
SDG #: K2407012 Level IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 8/17/04
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	PB&A
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	A	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples

1	LDW-B8a-S	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 13011B2a
SDG #: K2407012

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: DC

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
VI. Surrogate spikes				
Were all surrogate %R within QC limits?				
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?				
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?				
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Was a MS/MSD analyzed every 20 samples of each matrix?				

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 13011B29
SDG #: K2407012

VALIDATION FINDINGS CHECKLIST

Reviewer: 13
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 13011B2a
SDG #: K24070 12

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: B
2nd Reviewer: IC

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1	sediment	Frozen	8/17/04	9/23/04	12/27/04	95	J/R/A UJ

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 13011B2a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1000 std)	Recalculated RRF (1000 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	Rest confirm	12/27/01	~~Phenol~~ 2,4-DDE (1st internal standard)	1.082	1.082	1.146	1.146	5.04	5.04
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13011B2a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JD
2nd Reviewer: JC

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	1227010	12/22/04	~~Phenol~~ 2,4-DDE (1st internal standard)	1.146	not reported	1.12066	not reported	2.2
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13011B2a
SDG #: K2407012

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: (of 1
Reviewer:
2nd reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #1, 4,4'-DDT

Conc. = $\frac{(110625)(2500)(4)(1)(\quad)}{(1288126)(1.194)(37.3)(0.536)(\quad)}$

= 36 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

RECALC.2S

LDC #: 13011C2a **VALIDATION COMPLETENESS WORKSHEET** Date: 1/14/05
SDG #: K2407473 Level IV Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Chlorinated Pesticides (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 9/24/04
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	8081A
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	A	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples

1	LDW-B5a-S	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 13011c2a
SDG #: K2407473

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: E

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 25% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
VI. Surrogate spikes				
Were all surrogate %R within QC limits?				
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?				
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?				
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Was a MS/MSD analyzed every 20 samples of each matrix?				

LDC #: 13011C2a
SDG #: K2407473

VALIDATION FINDINGS CHECKLIST

Page: 2 of 3
Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds from the associated calibration standard?	✓			
XI. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			✓	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			✓	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			✓	
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

Validation Area	Yes	No	NA	Findings/Comments
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XVII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 13011c2a
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
1	sediment	frozen	9/24/04	10/18/04	12/27/04	70	J/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 13011C2a
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1,2,3 std)	Recalculated RRF (1,2,3 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	Best Comprm	12/27/01	~~Phenol~~ (1st internal standard)	1.082	1.082	1.146	1.146	5.04	5.04
			Naphthalene (2nd internal standard)						
			Flucrene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13011c2a
SDG #: K2407473

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	1227010	12/27/04	Phenol (1st internal standard)	1.146	not reported	1.120660	not reported	2.2
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 13011Cra
SDG #: K2401473

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #1 , 4,4-DDE

Conc. = (153994)(2500)(4)( )( )( )
( )(12999816)(0.926)(30.97)(0.649)( )

= 64 ug/kg

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

RECALC.2S