APPENDIX D-2 ROUND 2 DATA VALIDATION REPORT

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

LDC #15063/15115/15145/14235
August 9, 2006

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

SUBJECT: Lower Duwamish Waterway Group Sediment Sample Data Validation

Dear Ms. Mitchell,

Enclosed is our EPA Level III and Level IV data validation of analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The analyses were performed by Analytical Resources, Inc. and AXYS Analytical Services Ltd. Samples were analyzed for GC/MS Semivolatiles by EPA SW 846 Methods 8270D and 8270D-SIM, GC Polychlorinated Biphenyls by EPA SW 846 Method 8082, Butyltins by EPA SW 846 Methods 8270D-SIM/Krone Method, Metals by EPA SW 846 Methods 6010B/7471A, Total Organic Carbon by Plumb Method, Total Solids by EPA Method 160.3 and HRGC/HRMS Dioxins/Dibenzofurans by EPA Method 1613B. Samples are referenced under the following Sample Delivery Groups : JH57, JK31, JL31, JL32, JL33, JL34 and DPWG19451/WG19107. See the Sample Analysis Table (Attachment 1) for the number of samples reviewed.

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

Sincerely,

Stella S. Cuenco
Project Manager/Senior Chemist

CHEMICAL DATA QUALITY REVIEW FOR SUBSURFACE SEDIMENT SAMPLES (ROUND 2)

Lower Duwamish Waterway Group
LDC# 15063, 15115, 15145 & 15238

This report details the findings of an EPA Level III and EPA Level IV data validation of analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The analyses were performed by Analytical Resources, Inc. and AXYS Analytical Services Ltd. Samples were analyzed for GC/MS Semivolatiles by EPA SW 846 Methods 8270D and 8270D-SIM, GC Polychlorinated Biphenyls by EPA SW 846 Method 8082, Butyltins by EPA SW 846 Methods 8270D-SIM/Krone Method, Metals by EPA SW 846 Methods 6010B/7471A, Total Organic Carbon by Plumb Method, Total Solids by EPA Method 160.3 and HRGC/HRMS Dioxins/Dibenzofurans by EPA Method 1613B. Samples are referenced under the following Sample Delivery Groups : JH57, JK31, JL31, JL32, JL33, JL34 and DPWG19451/WG19107. 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), National Functional Guidelines for Inorganic Data Review (July 2002) and the EPA Region 10 SOP for the Validation of Polychlorinated Dibenzodioxin (PCDD) and Polychlorinated Dibenzofuran (PCDF) Data (Revision 2.0 January 31, 1996). Specific QC criteria used follow the Lower Duwamish Waterway Group Final Subsurface Sediment Sampling for Chemical Analyses Quality Assurance Project Plan (February 3, 2006). Where specific guidance is not available, the data has been evaluated in a conservative manner 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 Replicates

*Data were not reviewed for Level III.

Attachment 1

LDC #15063 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	(3) DATE DUE	TOC (Plumb)		Total Solids (160.3)																													
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	JK31	06/08/06	06/29/06	0	14	0	14																												
A	JK31	06/08/06	06/29/06	0	19	0	19																												
Total	B/SC			0	33	0	33	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	66

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

15063ST.wpd

Attachment 1

LDC #15115 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	(3) DATE DUE	SVOA (8270D)		SVOA (8270D -SIM)		PCBs (8082)		Metals & Hg (SW846)		Hg (7471A)		Butyltins (Krone)																			
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	JH57	06/15/06	07/07/06	0	12	0	12	0	16	0	9	0	3	0	4																		
A	JH57	06/15/06	07/07/06	0	7	0	7	0	17	0	4	0	0	0	1																		
Total	B/SC			0	19	0	19	0	33	0	13	0	3	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92

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

Attachment 1

LDC #15145 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Dioxins (1613B)																													
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	DPWG19451/WG19107	06/23/06	07/17/06	0	2																												
Total	B/SC			0	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	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 1

LDC #15238 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	(3) DATE DUE	SVOA (8270D)		SVOA (8270D -SIM)		PCBs (8082)		Hg (7471A)		Pb (6010B)		TOC (Plumb)		Total Solids (160.3)																			
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	JL31/JL32/JL33/JL34	07/17/06	08/07/06	0	16	0	16	0	50	0	4	0	6	0	62	0	62																		
Total	B/SC			0	16	0	16	0	50	0	4	0	6	0	62	0	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	216

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

15238ST.wpd

Attachment 2

SDG#: JK31 — VALIDATION SAMPLE TABLE — **LDC#:** 15063A

Project Name: Lower Duwamish Waterway Group — Parameters/Analytical Method — Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	TOC (Plumb)	Total Solids (160.3)											
LDW-SC26-6-8	JK31A	sediment	02/22/06	X	X											
LDW-SC26-11.1-12.1	JK31B	sediment	02/22/06	X	X											
LDW-SC51-3.8-5.8	JK31C	sediment	02/22/06	X	X											
LDW-SC37-5.3-6.9	JK31D	sediment	02/22/06	X	X											
LDW-SC28-5.5-7.5	JK31E	sediment	02/25/06	X	X											
LDW-SC1-4-6	JK31F	sediment	02/09/06	X	X											
LDW-SC4-4-6	JK31G	sediment	02/09/06	X	X											
LDW-SC33-4-6	JK31H	sediment	02/11/06	X	X											
LDW-SC201-4-6	JK31I	sediment	02/11/06	X	X											
LDW-SC41-4-6	JK31J	sediment	02/21/06	X	X											
LDW-SC45-5-6	JK31K	sediment	02/21/06	X	X											
LDW-SC15-4-6	JK31L	sediment	02/17/06	X	X											
LDW-SC20-4-6	JK31M	sediment	02/15/06	X	X											
LDW-SC39-4-6	JK31N	sediment	02/16/06	X	X											
LDW-SC12-4-6.7	JK31O	sediment	02/16/06	X	X											
LDW-SC6-6-8	JK31P	sediment	02/10/06	X	X											
LDW-SC8-4-6	JK31Q	sediment	02/10/06	X	X											
LDW-SC8-6-8	JK31R	sediment	02/10/06	X	X											
LDW-SC10-4-5	JK31S	sediment	02/10/06	X	X											
LDW-SC16-4-6	JK31T	sediment	02/14/06	X	X											
LDW-SC16-8-10	JK31U	sediment	02/14/06	X	X											
LDW-SC23-4-6	JK31V	sediment	02/17/06	X	X											
LDW-SC21-4-6.2	JK31W	sediment	02/15/06	X	X											
LDW-SC32-5.2-8	JK31X	sediment	02/11/06	X	X											
LDW-SC14-4.1-6	JK31Y	sediment	02/13/06	X	X											

Note: X = Validation was performed.

SDG#: JK31 — VALIDATION SAMPLE TABLE — **LDC#:** 15063A

Project Name: Lower Duwamish Waterway Group — Parameters/Analytical Method — Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	TOC (Plumb)	Total Solids (160.3)										
LDW-SC203-4-6	JK31Z	sediment	02/18/06	X	X										
LDW-SC25-4-6	JK31AA	sediment	02/18/06	X	X										
LDW-SC2-4-6	JK31AB	sediment	02/09/06	X	X										
LDW-SC2-10.7-12	JK31AC	sediment	02/09/06	X	X										
LDW-SC17-6-8.2	JK31AD	sediment	02/24/06	X	X										
LDW-SC19-4-6	JK31AE	sediment	02/24/06	X	X										
LDW-SC46-4-6.8	JK31AF	sediment	02/24/06	X	X										
LDW-SC49-4-6	JK31AG	sediment	02/06/06	X	X										
LDW-SC26-6-8MS	JK31AMS	sediment	02/22/06	X											
LDW-SC26-6-8DUP	JK31ADUP	sediment	02/22/06	X	X										
LDW-SC26-6-8TRP	JK31ATRP	sediment	02/22/06	X	X										
LDW-SC16-8-10MS	JK31UMS	sediment	02/14/06	X											
LDW-SC16-8-10DUP	JK31UDUP	sediment	02/14/06	X	X										
LDW-SC16-8-10TRP	JK31UTRP	sediment	02/14/06	X	X										

Note: X = Validation was performed.

Attachment 2

SDG#: JH57 — VALIDATION SAMPLE TABLE — **LDC#:** 15115A

Project Name: Lower Duwamish Waterway Group — Parameters/Analytical Method — Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270D)	SVOA (8270D -SIM)	PCBs (8082)	Metals SW846	Hg (7471A)	Butyltins (Krone)						
LDW-SC26-6-8	JH57A	sediment	02/22/06	X	X	X	X		X						
LDW-SC26-6-8DL	JH57ADL	sediment	02/22/06	X	X				X						
LDW-SC26-11.1-12.1	JH57B	sediment	02/22/06			X	X								
LDW-SC26-11.1-12.1DL	JH57BDL	sediment	02/22/06			X									
LDW-SC51-3.8-5.8	JH57C	sediment	02/22/06			X									
LDW-SC37-5.3-6.9	JH57D	sediment	02/22/06	X	X	X	X								
LDW-SC28-5.5-7.5	JH57E	sediment	02/25/06	X	X	X	X		X						
LDW-SC28-5.5-7.5DL	JH57EDL	sediment	02/25/06						X						
LDW-SC1-4-6	JH57F	sediment	02/09/06			X									
LDW-SC4-4-6	JH57G	sediment	02/09/06			X									
LDW-SC33-4-6	JH57H	sediment	02/11/06	X	X	X	X								
LDW-SC33-4-6DL	JH57HDL	sediment	02/11/06			X									
LDW-SC201-4-6	JH57I	sediment	02/11/06	X	X	X									
LDW-SC201-4-6DL	JH57IDL	sediment	02/11/06			X									
LDW-SC41-4-6	JH57J	sediment	02/21/06	X	X	X									
LDW-SC41-4-6DL	JH57JDL	sediment	02/21/06			X									
LDW-SC45-5-6	JH57K	sediment	02/21/06			X									
LDW-SC45-5-6DL	JH57KDL	sediment	02/21/06			X									
LDW-SC15-4-6	JH57L	sediment	02/17/06			X			X						
LDW-SC15-4-6DL	JH57LDL	sediment	02/17/06			X									
LDW-SC20-4-6	JH57M	sediment	02/15/06			X									
LDW-SC20-4-6DL	JH57MDL	sediment	02/15/06			X									
LDW-SC39-4-6	JH57N	sediment	02/16/06			X									
LDW-SC39-4-6DL	JH57NDL	sediment	02/16/06			X									
LDW-SC12-4-6.7	JH57O	sediment	02/16/06			X		X							

Note: X = Validation was performed.

SDG#: JH57 | VALIDATION SAMPLE TABLE | **LDC#:** 15115A

Project Name: Lower Duwamish Waterway Group | Parameters/Analytical Method | Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270D)	SVOA (8270D -SIM)	PCBs (8082)	Metals SW846	Hg (7471A)	Butyltins (Krone)						
LDW-SC12-4-6.7DL	JH57ODL	sediment	02/16/06			X									
LDW-SC6-6-8	JH57P	sediment	02/10/06	X	X	X	X								
LDW-SC8-4-6	JH57Q	sediment	02/10/06	X	X	X	X								
LDW-SC8-4-6RE	JH57QRE	sediment	02/10/06		X										
LDW-SC8-6-8	JH57R	sediment	02/10/06	X	X	X									
LDW-SC8-6-8DL	JH57RDL	sediment	02/10/06			X									
LDW-SC8-6-8RE	JH57RRE	sediment	02/10/06		X										
LDW-SC10-4-5	JH57S	sediment	02/10/06	X	X	X		X							
LDW-SC10-4-5DL	JH57SDL	sediment	02/10/06			X									
LDW-SC16-4-6	JH57T	sediment	02/14/06	X	X	X	X								
LDW-SC16-4-6DL	JH57TDL	sediment	02/14/06	X	X	X									
LDW-SC16-8-10	JH57U	sediment	02/14/06	X	X	X	X								
LDW-SC23-4-6	JH57V	sediment	02/17/06	X	X	X			X						
LDW-SC23-4-6DL	JH57VDL	sediment	02/17/06			X									
LDW-SC21-4-6.2	JH57W	sediment	02/15/16			X									
LDW-SC32-5.2-8	JH57X	sediment	02/11/06	X	X	X									
LDW-SC14-4.1-6	JH57Y	sediment	02/13/06	X	X	X		X							
LDW-SC14-4.1-6DL	JH57YDL	sediment	02/13/06			X									
LDW-SC14-4.1-6RE	JH57YRE	sediment	02/13/06		X										
LDW-SC203-4-6	JH57Z	sediment	02/18/06	X	X	X									
LDW-SC203-4-6RE	JH57ZRE	sediment	02/18/06		X										
LDW-SC25-4-6	JH57AA	sediment	02/18/06			X	X		X						
LDW-SC25-4-6DL	JH57AADL	sediment	02/18/06			X			X						
LDW-SC2-4-6	JH57AB	sediment	02/09/06	X	X	X	X								
LDW-SC2-4-6DL	JH57ABDL	sediment	02/09/06			X									
LDW-SC2-10.7-12	JH57AC	sediment	02/09/06	X	X	X	X								

Note: X = Validation was performed.

SDG#: JH57 | VALIDATION SAMPLE TABLE | **LDC#:** 15115A

Project Name: Lower Duwamish Waterway Group | Parameters/Analytical Method | Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270D)	SVOA (8270D -SIM)	PCBs (8082)	Metals SW846	Hg (7471A)	Butyltins (Krone)						
LDW-SC17-6-8.2	JH57AD	sediment	02/24/06	X	X	X	X								
LDW-SC17-6-8.2DL	JH57ADDL	sediment	02/24/06	X	X										
LDW-SC19-4-6	JH57AE	sediment	02/24/06			X									
LDW-SC19-4-6DL	JH57AEDL	sediment	02/24/06			X									
LDW-SC46-4-6.8	JH57AF	sediment	02/24/06			X									
LDW-SC46-4-6.8DL	JH57AFDL	sediment	02/24/06			X									
LDW-SC49-4-6	JH57AG	sediment	02/06/06			X									
LDW-SC49-4-6DL	JH57AGDL	sediment	02/06/06			X									
LDW-SC26-6-8MS	JH57AMS	sediment	02/22/06				X								
LDW-SC26-6-8DUP	JH57ADUP	sediment	02/22/06				X								
LDW-SC28-5.5-7.5MS	JH57EMS	sediment	02/25/06						X						
LDW-SC28-5.5-7.5MSD	JH57EMSD	sediment	02/25/06						X						
LDW-SC37-5.3-6.9MS	JH57DMS	sediment	02/22/06	X	X										
LDW-SC37-5.3-6.9MSD	JH57DMSD	sediment	02/22/06	X	X										
LDW-SC4-4-6MS	JH57GMS	sediment	02/09/06			X									
LDW-SC4-4-6MSD	JH57GMSD	sediment	02/09/06			X									
LDW-SC16-4-6MS	JH57TMS	sediment	02/14/06			X									
LDW-SC16-4-6MSD	JH57TMSD	sediment	02/14/06			X									
LDW-SC2-10.7-12MS	JH57ACMS	sediment	02/09/06			X									
LDW-SC2-10.7-12MSD	JH57ACMSD	sediment	02/09/06			X									

Note: X = Validation was performed.

Attachment 2

SDG#: DPWG19451/WG19107 VALIDATION SAMPLE TABLE **LDC#:** 15145A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	Dioxins (1613B)											
LDW-SC26-6-8	L8881-1	sediment	02/22/06	X											
LDW-SC20-4-6	L8881-2	sediment	02/15/06	X											
LDW-SC20-4-6DUP	L8881-2DUP	sediment	02/15/06	X											

Note: X = Validation was performed.

Attachment 2

SDG#: JL31/JL32/JL33/JL34 VALIDATION SAMPLE TABLE **LDC#:** 15238A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270D)	SVOA (8270D -SIM)	PCBs (8082)	Hg (7471A)	Pb (6010B)	TOC (Plumb)	Total Solids (160.3)					
LDW-SC1-0-.5	JL31A	sediment	02/09/06	X	X	X	X		X	X					
LDW-SC1-0-.5DL	JL31ADL	sediment	02/09/06		X										
LDW-SC1-.5-1	JL31B	sediment	02/09/06	X	X	X	X		X	X					
LDW-SC1-.5-1DL	JL31BDL	sediment	02/09/06		X										
LDW-SC1-1-1.5	JL31C	sediment	02/09/06	X	X	X	X		X	X					
LDW-SC1-1-1.5DL	JL31CDL	sediment	02/09/06		X										
LDW-SC1-1.5-2	JL31D	sediment	02/09/06	X	X	X	X		X	X					
LDW-SC1-1.5-2DL	JL31DDL	sediment	02/09/06		X										
LDW-SC6-0-0.5	JL31E	sediment	02/10/06			X			X	X					
LDW-SC6-0.5-1	JL31F	sediment	02/10/06			X			X	X					
LDW-SC6-1-1.5	JL31G	sediment	02/10/06			X			X	X					
LDW-SC6-1.5-2	JL31H	sediment	02/10/06			X			X	X					
LDW-SC6-2-2.5	JL31I	sediment	02/10/06			X			X	X					
LDW-SC6-2.5-3	JL31J	sediment	02/10/06			X			X	X					
LDW-SC6-3-3.5	JL31K	sediment	02/10/06			X			X	X					
LDW-SC6-3.5-4	JL31L	sediment	02/10/06			X			X	X					
LDW-SC6-4-4.5	JL31M	sediment	02/10/06			X			X	X					
LDW-SC33-0-0.5	JL31N	sediment	02/11/06			X		X	X	X					
LDW-SC33-0.5-1	JL31O	sediment	02/11/06			X		X	X	X					
LDW-SC33-1-1.5	JL31P	sediment	02/11/06			X		X	X	X					
LDW-SC33-1.5-2	JL31Q	sediment	02/11/06			X		X	X	X					
LDW-SC33-2-2.5	JL31R	sediment	02/11/06			X		X	X	X					
LDW-SC33-2.5-3	JL31S	sediment	02/11/06			X		X	X	X					
LDW-SC13-0-.5	JL32A	sediment	02/13/06			X			X	X					
LDW-SC13-.5-1	JL32B	sediment	02/13/06			X			X	X					

Note: X = Validation was performed.

SDG#: JL31/JL32/JL33/JL34 VALIDATION SAMPLE TABLE **LDC#:** 15238A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270D)	SVOA (8270D -SIM)	PCBs (8082)	Hg (7471A)	Pb (6010B)	TOC (Plumb)	Total Solids (160.3)					
LDW-SC13-1-1.5	JL32C	sediment	02/13/06			X			X	X					
LDW-SC13-1.5-2	JL32D	sediment	02/13/06			X			X	X					
LDW-SC13-2-2.5	JL32E	sediment	02/13/06			X			X	X					
LDW-SC13-2.5-3	JL32F	sediment	02/13/06			X			X	X					
LDW-SC13-3-3.5	JL32G	sediment	02/13/06			X			X	X					
LDW-SC27-0-0.5	JL32H	sediment	02/14/06			X			X	X					
LDW-SC27-0.5-1	JL32I	sediment	02/14/06			X			X	X					
LDW-SC27-1-1.5	JL32J	sediment	02/14/06			X			X	X					
LDW-SC27-1.5-2	JL32K	sediment	02/14/06			X			X	X					
LDW-SC27-2-2.5	JL32L	sediment	02/14/06			X			X	X					
LDW-SC27-2.5-3	JL32M	sediment	02/14/06			X			X	X					
LDW-SC27-3-3.5	JL32N	sediment	02/14/06			X			X	X					
LDW-SC27-3.5-4	JL32O	sediment	02/14/06			X			X	X					
LDW-SC27-4-4.5	JL32P	sediment	02/14/06			X			X	X					
LDW-SC12-0-.5	JL33A	sediment	02/16/06			X			X	X					
LDW-SC12-.5-1	JL33B	sediment	02/16/06			X			X	X					
LDW-SC12-1-1.5	JL33C	sediment	02/16/06			X			X	X					
LDW-SC12-1.5-2	JL33D	sediment	02/16/06			X			X	X					
LDW-SC12-2-2.5	JL33E	sediment	02/16/06			X			X	X					
LDW-SC12-2.5-3	JL33F	sediment	02/16/06			X			X	X					
LDW-SC12-3-3.5	JL33G	sediment	02/16/06			X			X	X					
LDW-SC12-3.5-4	JL33H	sediment	02/16/06			X			X	X					
LDW-SC23-0-0.5	JL33I	sediment	02/17/06	X	X				X	X					
LDW-SC23-0-0.5DL	JL33IDL	sediment	02/17/06		X										
LDW-SC23-0.5-1	JL33J	sediment	02/17/06	X	X				X	X					
LDW-SC23-0.5-1DL	JL33JDL	sediment	02/17/06		X										

Note: X = Validation was performed.

SDG#: JL31/JL32/JL33/JL34 VALIDATION SAMPLE TABLE **LDC#:** 15238A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270D)	SVOA (8270D -SIM)	PCBs (8082)	Hg (7471A)	Pb (6010B)	TOC (Plumb)	Total Solids (160.3)					
LDW-SC23-1-1.5	JL33K	sediment	02/17/06	X	X				X	X					
LDW-SC23-1-1.5DL	JL33KDL	sediment	02/17/06		X										
LDW-SC23-1.5-2	JL33L	sediment	02/17/06	X	X				X	X					
LDW-SC23-1.5-2DL	JL33LDL	sediment	02/17/06		X										
LDW-SC23-2-2.5	JL33M	sediment	02/17/06	X	X				X	X					
LDW-SC23-2.5-3	JL33N	sediment	02/17/06	X	X				X	X					
LDW-SC23-3-3.5	JL33O	sediment	02/17/06	X	X				X	X					
LDW-SC23-3-3.5DL	JL33ODL	sediment	02/17/06	X											
LDW-SC23-3.5-4	JL33P	sediment	02/17/06	X	X				X	X					
LDW-SC23-3.5-4DL	JL33PDL	sediment	02/17/06	X											
LDW-SC44-0-.5	JL34A	sediment	02/21/06			X			X	X					
LDW-SC44-.5-1	JL34B	sediment	02/21/06			X			X	X					
LDW-SC44-1-1.5	JL34C	sediment	02/21/06			X			X	X					
LDW-SC44-1.5-2	JL34D	sediment	02/21/06			X			X	X					
LDW-SC44-2-2.5	JL34E	sediment	02/21/06			X			X	X					
LDW-SC44-2.5-3	JL34F	sediment	02/21/06			X			X	X					
LDW-SC44-3-3.5	JL34G	sediment	02/21/06			X			X	X					
LDW-SC51-0-0.5	JL34H	sediment	02/22/06	X	X				X	X					
LDW-SC51-0.5-1	JL34I	sediment	02/22/06	X	X				X	X					
LDW-SC51-1-1.5	JL34J	sediment	02/22/06	X	X				X	X					
LDW-SC51-1.5-2	JL34K	sediment	02/22/06	X	X				X	X					
LDW-SC1-0-.5MS	JL31AMS	sediment	02/09/06				X								
LDW-SC1-0-.5DUP	JL31ADUP	sediment	02/09/06				X								
LDW-SC1-.5-1MS	JL31BMS	sediment	02/09/06	X	X										
LDW-SC1-.5-1MSD	JL31BMSD	sediment	02/09/06	X	X										
LDW-SC1-1-1.5MS	JL31CMS	sediment	02/09/06						X						

Note: X = Validation was performed.

SDG#: JL31/JL32/JL33/JL34 VALIDATION SAMPLE TABLE **LDC#:** 15238A

Project Name: Lower Duwamish Waterway Group Parameters/Analytical Method Project #04-08-06-24

Client ID #	Lab ID #	Matrix	Date Collected	SVOA (8270D)	SVOA (8270D -SIM)	PCBs (8082)	Hg (7471A)	Pb (6010B)	TOC (Plumb)	Total Solids (160.3)					
LDW-SC1-1-1.5DUP	JL31CDUP	sediment	02/09/06						X	X					
LDW-SC1-1-1.5TRP	JL31CTRP	sediment	02/09/06						X	X					
LDW-SC33-0-0.5MS	JL31NMS	sediment	02/11/06					X							
LDW-SC33-0-0.5DUP	JL31NDUP	sediment	02/11/06					X							
LDW-SC33-2-2.5MS	JL31RMS	sediment	02/11/06			X									
LDW-SC33-2-2.5MSD	JL31RMSD	sediment	02/11/06			X									
LDW-SC13-0-.5MS	JL32AMS	sediment	02/13/06			X									
LDW-SC13-0-.5MSD	JL32AMSD	sediment	02/13/06			X									
LDW-SC13-.5-1MS	JL32BMS	sediment	02/13/06						X						
LDW-SC13-.5-1DUP	JL32BDUP	sediment	02/13/06						X	X					
LDW-SC13-.5-1TRP	JL32BTRP	sediment	02/13/06						X	X					
LDW-SC12-0-.5MS	JL33AMS	sediment	02/16/06			X			X						
LDW-SC12-0-.5MSD	JL33AMSD	sediment	02/16/06			X									
LDW-SC12-0-.5DUP	JL33ADUP	sediment	02/16/06						X	X					
LDW-SC12-0-.5TRP	JL33ATRP	sediment	02/16/06						X						
LDW-SC44-0-.5MS	JL34AMS	sediment	02/21/06						X						
LDW-SC44-0-.5DUP	JL34ADUP	sediment	02/21/06						X	X					
LDW-SC44-0-.5TRP	JL34ATRP	sediment	02/21/06						X						

Note: X = Validation was performed.

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.

The following qualifiers are for the dioxin/dibenzofuran analysis only:

J1 Blank Contamination: Indicates possible high bias and/or false positives.

J2 Calibration Range exceeded: Indicates possible low bias.

J3 Holding times not met: Indicates low bias for most analytes.

J4 Other QC parameters outside control limits: bias not readily determined.

J5 Other QC parameters outside control limits. The reported results appear to be biased high. The actual value of target compound in the sample may be lower than the value reported by the laboratory.

J6 Other QC parameters outside control limits. The reported results appear to be biased low. The actual value of target compound in the sample may be higher than the value reported by the laboratory.

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.

Overall Data Assessment

I. Usability

A. Instrument calibration, method blank contamination, compound quantitation and various QC exceedance problems warranted the qualification of a portion of the data set.

- Due to continuing calibration %D and RRF problems, results for several compounds were qualified as estimated (J/UJ) in the semivolatile-SIM analyses.

- Due to method blank contamination, phenol was qualified as non-detected (U) in the semivolatile analyses.

- Due to compound quantitation %RPD problems, detected results were qualified as estimated (J) for several compounds in the PCB analyses.

- Due to various QC accuracy and precision problems, results were qualified as estimated (J/UJ) in the semivolatile, semivolatile-SIM, PCB and metal analyses.

B. No action was taken when the SRM results were outside the limit of Mean ± Standard Deviation for the organic analyses since the SRM standards were outdated and there were no certified QC limits established.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J/UJ) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

GC/MS Semivolatiles by EPA SW 846 Method 8270D

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/MS Instrument Performance Check

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

All ion abundance requirements were met.

III. Initial Calibration

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.

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.

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

V. Blanks

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

SDG	Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
JH57	JH7MBS1	5/10/06	Phenol	110 ug/Kg	LDW-SC26-6-8** LDW-SC26-6-8DL** LDW-SC37-5.3-6.9** LDW-SC28-5.5-7.5** LDW-SC33-4-6** LDW-SC201-4-6** LDW-SC41-4-6** LDW-SC6-6-8 LDW-SC8-4-6 LDW-SC8-6-8 LDW-SC10-4-5 LDW-SC16-4-6 LDW-SC16-4-6DL LDW-SC16-8-10** LDW-SC23-4-6 LDW-SC32-5.2-8 LDW-SC14-4.1-6 LDW-SC203-4-6 LDW-SC2-4-6 LDW-SC2-10.7-12 LDW-SC17-6-8.2 LDW-SC17-6-8.2DL
JL31 JL33 JL34	MB-061206	6/12/06	Phenol	290 ug/Kg	LDW-SC1-0-.5 LDW-SC1-.5-1 LDW-SC1-1-1.5 LDW-SC1-1.5-2 LDW-SC23-0-0.5 LDW-SC23-0.5-1 LDW-SC23-1-1.5 LDW-SC23-1.5-2 LDW-SC23-2-2.5 LDW-SC23-2.5-3 LDW-SC23-3-3.5 LDW-SC23-3-3.5DL LDW-SC23-3.5-4 LDW-SC23-3.5-4DL LDW-SC51-0-0.5 LDW-SC51-0.5-1 LDW-SC51-1-1.5 LDW-SC51-1.5-2

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:

SDG	Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
JH57	LDW-SC2-4-6	Phenol	73 ug/Kg	73U ug/Kg
JL31	LDW-SC1-0-.5	Phenol	70 ug/Kg	70U ug/Kg

SDG	Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
JL33	LDW-SC23-0-0.5	Phenol	400 ug/Kg	400U ug/Kg
JL33	LDW-SC23-0.5-1	Phenol	65 ug/Kg	65U ug/Kg
JL34	LDW-SC51-0-0.5	Phenol	96 ug/Kg	96U 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.

VIII. Laboratory Control Samples (LCS)

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

SDG	LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
JL31 JL33 JL34	LCS-061206	4-Chloroaniline Aniline	38.9 (40-130) 22.9 (40-130)	LDW-SC1-0-.5 LDW-SC1-.5-1 LDW-SC1-1-1.5 LDW-SC1-1.5-2 LDW-SC23-0-0.5 LDW-SC23-0.5-1 LDW-SC23-1-1.5 LDW-SC23-1.5-2 LDW-SC23-2-2.5 LDW-SC23-2.5-3 LDW-SC23-3-3.5 LDW-SC23-3-3.5DL LDW-SC23-3.5-4 LDW-SC23-3.5-4DL LDW-SC51-0-0.5 LDW-SC51-0.5-1 LDW-SC51-1-1.5 LDW-SC51-1.5-2	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Standard reference material was performed at the required frequencies.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

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

XI. Target Compound Identifications

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

XII. Compound Quantitation and CRQLs

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

SDG	Sample	Compound	Finding	Criteria	Flag	A or P
JH57	LDW-SC26-6-8**	Phenanthrene Fluoranthene Pyrene	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A N/A	-
JH57	LDW-SC16-4-6 LDW-SC17-6-8.2	Fluoranthene Pyrene	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A	-
JL33	LDW-SC23-3-3.5	Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A N/A N/A N/A N/A	-
JL33	LDW-SC23-3.5-4	Fluoranthene	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A	-

N/A = Not applicable

For the results above flagged "Not applicable", the affected compound results in the associated samples were deemed unusable and did not warrant qualification of the data.

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

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:

SDG	Sample	Compound	Flag	A or P
JH57	LDW-SC26-6-8**	Phenanthrene Fluoranthene Pyrene 1,3-Dichlorobenzene Dimethylphthalate	R R R R R	A
JH57	LDW-SC26-6-8DL**	All TCL compounds except Phenanthrene Fluoranthene Pyrene	R	A
JH57	LDW-SC16-4-6 LDW-SC17-6-8.2	Fluoranthene Pyrene 1,3-Dichlorobenzene Dimethylphthalate	R R R R	A
JH57	LDW-SC16-4-6DL LDW-SC17-6-8.2DL	All TCL compounds except Fluoranthene Pyrene	R	A
JH57	LDW-SC37-5.3-6.9** LDW-SC28-5.5-7.5** LDW-SC33-4-6** LDW-SC201-4-6** LDW-SC41-4-6** LDW-SC6-6-8 LDW-SC8-4-6 LDW-SC8-6-8 LDW-SC10-4-5 LDW-SC16-8-10** LDW-SC23-4-6 LDW-SC32-5.2-8 LDW-SC14-4.1-6 LDW-SC203-4-6 LDW-SC2-4-6 LDW-SC2-10.7-12	1,3-Dichlorobenzene Dimethylphthalate	R R	A
JL33	LDW-SC23-3-3.5	Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene	R R R R R R	A
JL33	LDW-SC23-3-3.5DL	All TCL compounds except Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene	R	A
JL33	LDW-SC23-3.5-4	Fluoranthene	R	A

SDG	Sample	Compound	Flag	A or P
JL33	LDW-SC23-3.5-4DL	All TCL compounds except Fluoranthene	R	A

XVI. Field Replicates

Samples LDW-SC33-4-6** and LDW-SC201-4-6** were identified as field replicates. No semivolatiles were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SC33-4-6**	LDW-SC201-4-6**	
JH57	Naphthalene	410	380	8 (≤50)
JH57	2-Methylnaphthalene	63	82	26 (≤50)
JH57	Acenaphthene	1000	710	34 (≤50)
JH57	Dibenzofuran	380	280	30 (≤50)
JH57	Fluorene	630	510	21 (≤50)
JH57	Phenanthrene	1400	1300	7 (≤50)
JH57	Anthracene	420	490	15 (≤50)
JH57	Fluoranthene	3200	5000	44 (≤50)
JH57	Pyrene	2600	4700	58 (≤50)
JH57	Benzo(a)anthracene	610	780	24 (≤50)
JH57	Bis(2-ethylhexyl)phthalate	56	65U	Not calculable
JH57	Chrysene	560	900	47 (≤50)
JH57	Benzo(b)fluoranthene	380	650	52 (≤50)
JH57	Benzo(k)fluoranthene	250	440	55 (≤50)
JH57	Benzo(a)pyrene	270	500	60 (≤50)
JH57	Indeno(1,2,3-cd)pyrene	84	180	73 (≤50)
JH57	Benzo(g,h,i)perylene	110	210	63 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SC33-4-6**	LDW-SC201-4-6**	
JH57	1-Methylnaphthalene	76	110	37 (≤50)

XVII. Field Blanks

No field blanks were identified in this SDG.

Lower Duwamish Waterway Group
Semivolatiles - Data Qualification Summary - SDGs JH57, JL31, JL33 and JL34

SDG	Sample	Compound	Flag	A or P	Reason
JL31 JL33 JL34	LDW-SC1-0-.5 LDW-SC1-.5-1 LDW-SC1-1-1.5 LDW-SC1-1.5-2 LDW-SC23-0-0.5 LDW-SC23-0.5-1 LDW-SC23-1-1.5 LDW-SC23-1.5-2 LDW-SC23-2-2.5 LDW-SC23-2.5-3 LDW-SC23-3-3.5 LDW-SC23-3-3.5DL LDW-SC23-3.5-4 LDW-SC23-3.5-4DL LDW-SC51-0-0.5 LDW-SC51-0.5-1 LDW-SC51-1-1.5 LDW-SC51-1.5-2	4-Chloroaniline Aniline	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)
JH57	LDW-SC26-6-8**	Phenanthrene Fluoranthene Pyrene 1,3-Dichlorobenzene Dimethylphthalate	R R R R R	A	Overall assessment of data
JH57	LDW-SC26-6-8DL**	All TCL compounds except Phenanthrene Fluoranthene Pyrene	R	A	Overall assessment of data
JH57	LDW-SC16-4-6 LDW-SC17-6-8.2	Fluoranthene Pyrene 1,3-Dichlorobenzene Dimethylphthalate	R R R R	A	Overall assessment of data
JH57	LDW-SC16-4-6DL LDW-SC17-6-8.2DL	All TCL compounds except Fluoranthene Pyrene	R	A	Overall assessment of data
JH57	LDW-SC37-5.3-6.9** LDW-SC28-5.5-7.5** LDW-SC33-4-6** LDW-SC201-4-6** LDW-SC41-4-6** LDW-SC6-6-8 LDW-SC8-4-6 LDW-SC8-6-8 LDW-SC10-4-5 LDW-SC16-8-10** LDW-SC23-4-6 LDW-SC32-5.2-8 LDW-SC14-4.1-6 LDW-SC203-4-6 LDW-SC2-4-6 LDW-SC2-10.7-12	1,3-Dichlorobenzene Dimethylphthalate	R R	A	Overall assessment of data

SDG	Sample	Compound	Flag	A or P	Reason
JL33	LDW-SC23-3-3.5	Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene	R R R R R R	A	Overall assessment of data
JL33	LDW-SC23-3-3.5DL	All TCL compounds except Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene	R	A	Overall assessment of data
JL33	LDW-SC23-3.5-4	Fluoranthene	R	A	Overall assessment of data
JL33	LDW-SC23-3.5-4DL	All TCL compounds except Fluoranthene	R	A	Overall assessment of data

Lower Duwamish Waterway Group
Semivolatiles - Laboratory Blank Data Qualification Summary - SDGs JH57, JL31, JL33 and JL34

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
JH57	LDW-SC2-4-6	Phenol	73U ug/Kg	A
JL31	LDW-SC1-0-.5	Phenol	70U ug/Kg	A
JL33	LDW-SC23-0-0.5	Phenol	400U ug/Kg	A
JL33	LDW-SC23-0.5-1	Phenol	65U ug/Kg	A
JL34	LDW-SC51-0-0.5	Phenol	96U ug/Kg	A

GC/MS Semivolatiles by EPA SW 846 Method 8270D 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.

II. GC/MS Instrument Performance Check

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

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 and system monitoring compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% for all compounds with the following exceptions:

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
JH57	5/18/06	2,4-Dimethylphenol	35.72017	LDW-SC26-6-8** LDW-SC28-5.5-7.5** LDW-SC33-4-6** LDW-SC201-4-6** LDW-SC41-4-6** LDW-SC8-4-6 LDW-SC8-6-8 LDW-SC16-4-6 LDW-SC16-8-10** LDW-SC23-4-6 LDW-SC32-5.2-8 LDW-SC14-4.1-6 LDW-SC203-4-6 LDW-SC17-6-8.2	J (all detects) UJ (all non-detects)	A

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
JH57	5/19/06	N-Nitroso-di-n-propylamine 1,2,4-Trichlorobenzene Hexachlorobutadiene Dimethylphthalate	32.5 89.9 26.2 79.7	LDW-SC26-6-8DL** LDW-SC8-4-6RE LDW-SC8-6-8RE LDW-SC16-4-6DL LDW-SC14-4.1-6RE LDW-SC203-4-6RE LDW-SC17-6-8.2DL	J (all detects) UJ (all non-detects)	P
JL31 JL33 JL34	6/20/06	2-Methylphenol 2,4-Dimethylphenol 1,2,4-Trichlorobenzene	57.8 29.6 26.3	LDW-SC1-0-.5DL LDW-SC1-.5-1DL LDW-SC1-1-1.5DL LDW-SC1-1.5-2DL LDW-SC23-0-0.5DL LDW-SC23-0.5-1DL LDW-SC23-1-1.5DL LDW-SC23-2-2.5 LDW-SC23-2.5-3 LDW-SC23-3-3.5 LDW-SC23-3.5-4 LDW-SC51-0-0.5 LDW-SC51-0.5-1 LDW-SC51-1-1.5 LDW-SC51-1.5-2	J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within validation criteria with the following exceptions:

SDG	Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
JH57	5/19/06	1,2,4-Trichlorobenzene	0.03227 (≥0.05)	LDW-SC26-6-8DL** LDW-SC8-4-6RE LDW-SC8-6-8RE LDW-SC16-4-6DL LDW-SC14-4.1-6RE LDW-SC203-4-6RE LDW-SC17-6-8.2DL	J (all detects) UJ (all non-detects)	A

V. Blanks

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

VI. Surrogate Spikes

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

SDG	Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
JL33	LDW-SC23-1.5-2	Nitrobenzene-d5 2-Fluorobiphenyl	29.6 (40-130) 38.4 (40-130)	All base neutral 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:

SDG	Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JL31	LDW-SC1-.5-1MS/MSD (LDW-SC1-.5-1)	1,2,4-Trichlorobenzene	28.5 (40-130)	32.8 (40-130)	-	J (all detects) UJ (all non-detects)	A
		N-Nitroso-di-n-propylamine	0 (40-130)	0 (40-130)	-	J (all detects) UJ (all non-detects)	

Although the percent recoveries of N-Nitroso-di-n-propylamine in the above MS/MSD were severely low (0%), the associated result was qualified as estimated (J/UJ) due to matrix interference.

VIII. Laboratory Control Samples (LCS)

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

Standard reference material was performed at the required frequencies.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

SDG	Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
JH57	LDW-SC17-6-8.2	Acenaphthene-d10	276496 (286380-1145522)	Dimethylphthalate	J (all detects) UJ (all non-detects)	A
JH57	LDW-SC17-6-8.2	Chrysene-d12	611047 (147566-590266)	Butylbenzylphthalate	J (all detects)	A
JH57	LDW-SC16-4-6	Acenaphthene-d10	261575 (286380-1145522)	Dimethylphthalate	J (all detects) UJ (all non-detects)	A
JH57	LDW-SC16-4-6	Chrysene-d12	702517 (147566-590266)	Butylbenzylphthalate	J (all detects)	A
JH57	LDW-SC14-4.1-6	Chrysene-d12 Perylene-d12	685000 (147566-590266) 720075 (178804-715218)	Butylbenzylphthalate Dibenz(a,h)anthracene	J (all detects) J (all detects)	A

SDG	Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
JH57	LDW-SC203-4-6	Chrysene-d12	708757 (147566-590266)	Butylbenzylphthalate	J (all detects)	A
JH57	LDW-SC8-4-6	Chrysene-d12	715010 (147566-590266)	Butylbenzylphthalate	J (all detects)	A
JH57	LDW-SC8-6-8	Chrysene-d12 Perylene-d12	923397 (147566-590266) 746730 (178804-715218)	Butylbenzylphthalate Dibenz(a,h)anthracene	J (all detects) J (all detects)	A
JH57	LDW-SC26-6-8**	Chrysene-d12 Perylene-d12	763575 (147566-590266) 733567 (178804-715218)	Butylbenzylphthalate Dibenz(a,h)anthracene	J (all detects) J (all detects)	A
JL31	LDW-SC1-0-.5	Chrysene-d12 Perylene-d12	596775 (126152-504606) 683744 (145432-581726)	Butylbenzylphthalate Dibenz(a,h)anthracene	J (all detects) J (all detects)	A
JL31	LDW-SC1-.5-1	Perylene-d12	683648 (145432-581726)	Dibenz(a,h)anthracene	J (all detects)	A
JL31	LDW-SC1-1-1.5	Phenanthrene-d10 Chrysene-d12	661632 (160778-643110) 638406 (126152-504606)	N-Nitrosodiphenylamine Hexachlorobenzene Pentachlorophenol Butylbenzylphthalate	J (all detects) J (all detects) J (all detects) J (all detects)	A
JL31	LDW-SC1-1.5-2	Phenanthrene-d10 Chrysene-d12	647040 (160778-643110) 615323 (126152-504606)	N-Nitrosodiphenylamine Hexachlorobenzene Pentachlorophenol Butylbenzylphthalate	J (all detects) J (all detects) J (all detects) J (all detects)	A
JL33	LDW-SC23-0-0.5	Chrysene-d12 Perylene-d12	556060 (126152-504606) 618937 (145432-581726)	Butylbenzylphthalate Dibenz(a,h)anthracene	J (all detects) J (all detects)	A
JL33	LDW-SC23-0.5-1	Chrysene-d12 Perylene-d12	619712 (126152-504606) 620519 (145432-581726)	Butylbenzylphthalate Dibenz(a,h)anthracene	J (all detects) J (all detects)	A
JL33	LDW-SC23-1-1.5	Chrysene-d12 Perylene-d12	592829 (126152-504606) 593044 (145432-581726)	Butylbenzylphthalate Dibenz(a,h)anthracene	J (all detects) J (all detects)	A

XI. Target Compound Identifications

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

XII. Compound Quantitation and CRQLs

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

SDG	Sample	Compound	Finding	Criteria	Flag	A or P
JH57	LDW-SC26-6-8**	Pentachlorophenol	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A	-

N/A = Not applicable

For the result above flagged "Not applicable", the affected compound result in the associated sample was deemed unusable and did not warrant qualification of the data.

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

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:

SDG	Sample	Compound	Flag	A or P
JH57	LDW-SC26-6-8**	Pentachlorophenol	R	A
JH57	LDW-SC26-6-8DL**	All TCL compounds except Pentachlorophenol	R	A
JH57	LDW-SC8-4-6	Dibenz(a,h)anthracene Pentachlorophenol N-Nitrosodiphenylamine	R R R	A
JH57	LDW-SC8-4-6RE	All TCL compounds except Dibenz(a,h)anthracene Pentachlorophenol N-Nitrosodiphenylamine	R	A
JH57	LDW-SC8-6-8	Dibenz(a,h)anthracene 2-Methylphenol Pentachlorophenol N-Nitrosodiphenylamine	R R R R	A

SDG	Sample	Compound	Flag	A or P
JH57	LDW-SC8-6-8RE	All TCL compounds except Dibenz(a,h)anthracene 2-Methylphenol Pentachlorophenol N-Nitrosodiphenylamine	R	A
JH57	LDW-SC14-4.1-6	Dibenz(a,h)anthracene Butylbenzylphthalate N-Nitrosodiphenylamine	R R R	A
JH57	LDW-SC14-4.1-6RE	All TCL compounds except Dibenz(a,h)anthracene Butylbenzylphthalate N-Nitrosodiphenylamine	R	A
JH57	LDW-SC203-4-6	Dibenz(a,h)anthracene Butylbenzylphthalate N-Nitrosodiphenylamine 2,4-Dimethylphenol	R R R R	A
JH57	LDW-SC203-4-6RE	All TCL compounds except Dibenz(a,h)anthracene Butylbenzylphthalate N-Nitrosodiphenylamine 2,4-Dimethylphenol	R	A
JH57 JL31 JL33	LDW-SC16-4-6DL LDW-SC17-6-8.2DL LDW-SC1-0-.5DL LDW-SC1-.5-1DL LDW-SC1-1-1.5DL LDW-SC1-1.5-2DL LDW-SC23-0-0.5DL LDW-SC23-0.5-1DL LDW-SC23-1-1.5DL LDW-SC23-1.5-2DL	All TCL compounds	R	A

XVI. Field Replicates

Samples LDW-SC33-4-6** and LDW-SC201-4-6** were identified as field replicates. No semivolatiles were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SC33-4-6**	LDW-SC201-4-6**	
JH57	Dibenz(a,h)anthracene	57	100	55 (≤50)
JH57	1,4-Dichlorobenzene	5.9	3.9	41 (≤50)
JH57	Pentachlorophenol	36	36	0 (≤50)
JH57	2,4-Dimethylphenol	6.5U	6.5	Not calculable

XVII. Field Blanks

No field blanks were identified in this SDG.

Lower Duwamish Waterway Group
Semivolatiles - (SIM) - Data Qualification Summary - SDGs JH57, JL31, JL33 and JL34

SDG	Sample	Compound	Flag	A or P	Reason
JH57	LDW-SC26-6-8** LDW-SC28-5.5-7.5** LDW-SC33-4-6** LDW-SC201-4-6** LDW-SC41-4-6** LDW-SC8-4-6 LDW-SC8-6-8 LDW-SC16-4-6 LDW-SC16-8-10** LDW-SC23-4-6 LDW-SC32-5.2-8 LDW-SC14-4.1-6 LDW-SC203-4-6 LDW-SC17-6-8.2	2,4-Dimethylphenol	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
JH57	LDW-SC26-6-8DL** LDW-SC8-4-6RE LDW-SC8-6-8RE LDW-SC16-4-6DL LDW-SC14-4.1-6RE LDW-SC203-4-6RE LDW-SC17-6-8.2DL	N-Nitroso-di-n-propylamine 1,2,4-Trichlorobenzene Hexachlorobutadiene Dimethylphthalate	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
JL31 JL33 JL34	LDW-SC1-0-.5DL LDW-SC1-.5-1DL LDW-SC1-1-1.5DL LDW-SC1-1.5-2DL LDW-SC23-0-0.5DL LDW-SC23-0.5-1DL LDW-SC23-1-1.5DL LDW-SC23-2-2.5 LDW-SC23-2.5-3 LDW-SC23-3-3.5 LDW-SC23-3.5-4 LDW-SC51-0-0.5 LDW-SC51-0.5-1 LDW-SC51-1-1.5 LDW-SC51-1.5-2	2-Methylphenol 2,4-Dimethylphenol 1,2,4-Trichlorobenzene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
JH57	LDW-SC26-6-8DL** LDW-SC8-4-6RE LDW-SC8-6-8RE LDW-SC16-4-6DL LDW-SC14-4.1-6RE LDW-SC203-4-6RE LDW-SC17-6-8.2DL	1,2,4-Trichlorobenzene	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
JL33	LDW-SC23-1.5-2	1,4-Dichlorobenzene 1,2-Dichlorobenzene N-Nitroso-di-n-propylamine 1,2,4-Trichlorobenzene Hexachlorobutadiene N-Nitrosodiphenylamine Hexachlorobenzene Butylbenzylphthalate Dibenz(a,h)anthracene Benzyl alcohol N-Nitrosodimethylamine	J (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

SDG	Sample	Compound	Flag	A or P	Reason
JL31	LDW-SC1-.5-1	1,2,4-Trichlorobenzene N-Nitroso-di-n-propylamine	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
JH57	LDW-SC17-6-8.2 LDW-SC16-4-6	Dimethylphthalate	J (all detects) UJ (all non-detects)	A	Internal standards (area)
JH57	LDW-SC17-6-8.2 LDW-SC16-4-6 LDW-SC203-4-6 LDW-SC8-4-6	Butylbenzylphthalate	J (all detects)	A	Internal standards (area)
JH57 JL31 JL33	LDW-SC14-4.1-6 LDW-SC8-6-8 LDW-SC26-6-8** LDW-SC1-0-.5 LDW-SC23-0-0.5 LDW-SC23-0.5-1 LDW-SC23-1-1.5	Butylbenzylphthalate Dibenz(a,h)anthracene	J (all detects) J (all detects)	A	Internal standards (area)
JL31	LDW-SC1-.5-1	Dibenz(a,h)anthracene	J (all detects)	A	Internal standards (area)
JL31	LDW-SC1-1-1.5 LDW-SC1-1.5-2	N-Nitrosodiphenylamine Hexachlorobenzene Pentachlorophenol Butylbenzylphthalate	J (all detects) J (all detects) J (all detects) J (all detects)	A	Internal standards (area)
JH57	LDW-SC26-6-8**	Pentachlorophenol	R	A	Overall assessment of data
JH57	LDW-SC26-6-8DL**	All TCL compounds except Pentachlorophenol	R	A	Overall assessment of data
JH57	LDW-SC8-4-6	Dibenz(a,h)anthracene Pentachlorophenol N-Nitrosodiphenylamine	R R R	A	Overall assessment of data
JH57	LDW-SC8-4-6RE	All TCL compounds except Dibenz(a,h)anthracene Pentachlorophenol N-Nitrosodiphenylamine	R	A	Overall assessment of data
JH57	LDW-SC8-6-8	Dibenz(a,h)anthracene 2-Methylphenol Pentachlorophenol N-Nitrosodiphenylamine	R R R R	A	Overall assessment of data
JH57	LDW-SC8-6-8RE	All TCL compounds except Dibenz(a,h)anthracene 2-Methylphenol Pentachlorophenol N-Nitrosodiphenylamine	R	A	Overall assessment of data
JH57	LDW-SC14-4.1-6	Dibenz(a,h)anthracene Butylbenzylphthalate N-Nitrosodiphenylamine	R R R	A	Overall assessment of data

SDG	Sample	Compound	Flag	A or P	Reason
JH57	LDW-SC14-4.1-6RE	All TCL compounds except Dibenz(a,h)anthracene Butylbenzylphthalate N-Nitrosodiphenylamine	R	A	Overall assessment of data
JH57	LDW-SC203-4-6	Dibenz(a,h)anthracene Butylbenzylphthalate N-Nitrosodiphenylamine 2,4-Dimethylphenol	R R R R	A	Overall assessment of data
JH57	LDW-SC203-4-6RE	All TCL compounds except Dibenz(a,h)anthracene Butylbenzylphthalate N-Nitrosodiphenylamine 2,4-Dimethylphenol	R	A	Overall assessment of data
JH57 JL31 JL33	LDW-SC16-4-6DL LDW-SC17-6-8.2DL LDW-SC1-0-.5DL LDW-SC1-.5-1DL LDW-SC1-1-1.5DL LDW-SC1-1.5-2DL LDW-SC23-0-0.5DL LDW-SC23-0.5-1DL LDW-SC23-1-1.5DL LDW-SC23-1.5-2DL	All TCL compounds	R	A	Overall assessment of data

Lower Duwamish Waterway Group
Semivolatiles - (SIM) - Laboratory Blank Data Qualification Summary - SDGs JH57, JL31, JL33 and JL34

No Sample Data Qualified in this SDG

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.

II. GC/ECD Instrument Performance Check

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

III. Initial Calibration

Initial calibration of 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 for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

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

V. Blanks

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

VI. Surrogate Spikes and Internal Standards

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:

SDG	Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
JH57	LDW-SC15-4-6	ZB5	Decachlorobiphenyl	201 (50-150)	All TCL compounds	J (all detects)	A
JH57	LDW-SC20-4-6	ZB35	Decachlorobiphenyl	249.9 (50-150)	All TCL compounds	J (all detects)	A
JH57	LDW-SC39-4-6	ZB35	Decachlorobiphenyl Tetrachloro-m-xylene	232.8 (50-150) 43.8 (50-150)	All TCL compounds	J (all detects) UJ (all non-detects)	A
JH57	LDW-SC12-4-6.7	ZB35 ZB5	Decachlorobiphenyl Tetrachloro-m-xylene	549.5 (50-150) 42.2 (50-150)	All TCL compounds	J (all detects) UJ (all non-detects)	A
JH57	LDW-SC16-8-10**	ZB35	Decachlorobiphenyl	195 (50-150)	All TCL compounds	J (all detects)	P
JH57	LDW-SC23-4-6**	ZB5	Decachlorobiphenyl	207 (50-150)	All TCL compounds	J (all detects)	A
JH57	LDW-SC14-4.1-6**	ZB5	Decachlorobiphenyl	236 (50-150)	All TCL compounds	J (all detects)	A

All internal standard areas and retention times 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 not within QC limits. Since the MS/MSD samples were diluted out, no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

Standard reference material was performed at the required frequencies.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Although sulfur and acid cleanup was not required by the method, it was performed by the laboratory.

Florisil cleanup was not required and therefore not performed.

b. GPC Calibration

GPC cleanup was not required and therefore not performed.

XI. Target Compound Identification

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

XII. Compound Quantitation and CRQLs

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

SDG	Sample	Compound	Finding	Criteria	Flag	A or P
JH57	LDW-SC26-11.1-12.1** LDW-SC33-4-6** LDW-SC201-4-6** LDW-SC41-4-6** LDW-SC20-4-6 LDW-SC12-4-6.7 LDW-SC23-4-6** LDW-SC14-4.1-6** LDW-SC2-4-6 LDW-SC46-4-6.8	Aroclor-1254 Aroclor-1260	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A N/A	-
JH57	LDW-SC45-5-6** LDW-SC8-6-8 LDW-SC16-4-6	Aroclor-1254	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A	-
JH57	LDW-SC15-4-6 LDW-SC10-4-5 LDW-SC25-4-6 LDW-SC19-4-6 LDW-SC49-4-6	Aroclor-1242 Aroclor-1254 Aroclor-1260	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A N/A	-
JH57	LDW-SC39-4-6	Aroclor-1260	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A	-

N/A = Not applicable

For the results above flagged "Not applicable", the affected compound results in the associated samples were deemed unusable and did not warrant qualification of the data.

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

SDG	Sample	Compound	%RPD	Flag	A or P
JH57	LDW-SC41-4-6**	Aroclor-1254 Aroclor-1260	53 51	J (all detects) J (all detects)	A

SDG	Sample	Compound	%RPD	Flag	A or P
JH57	LDW-SC45-5-6**	Aroclor-1260	61	J (all detects)	A
JH57 JL31 JL34	LDW-SC2-4-6 LDW-SC33-1.5-2 LDW-SC44-.5-1	Aroclor-1260	46	J (all detects)	A
JL33	LDW-SC12-2-2.5	Aroclor-1260	42	J (all detects)	A

The pattern of peaks on detected samples were possibly weathered aroclors. The results were reported by the laboratory on the best possible match.

Raw data were not evaluated for the samples reviewed by Level III criteria.

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:

SDG	Sample	Compound	Flag	A or P
JH57	LDW-SC26-11.1-12.1** LDW-SC33-4-6** LDW-SC201-4-6** LDW-SC12-4-6.7 LDW-SC14-4.1-6** LDW-SC2-4-6 LDW-SC46-4-6.8 LDW-SC45-5-6**	Aroclor-1254 Aroclor-1260	R R	A
JH57	LDW-SC26-11.1-12.1DL** LDW-SC33-4-6DL** LDW-SC201-4-6DL** LDW-SC12-4-6.7DL LDW-SC14-4.1-6DL** LDW-SC2-4-6DL LDW-SC46-4-6.8DL LDW-SC45-5-6DL**	All TCL compounds except Aroclor-1254 Aroclor-1260	R	A
JH57	LDW-SC8-6-8 LDW-SC16-4-6	Aroclor-1254	R	A
JH57	LDW-SC8-6-8DL LDW-SC16-4-6DL	All TCL compounds except Aroclor-1254	R	A
JH57	LDW-SC41-4-6** LDW-SC20-4-6 LDW-SC23-4-6** LDW-SC15-4-6 LDW-SC10-4-5 LDW-SC25-4-6 LDW-SC19-4-6 LDW-SC49-4-6	Aroclor-1242 Aroclor-1254 Aroclor-1260	R R R	A

SDG	Sample	Compound	Flag	A or P
JH57	LDW-SC41-4-6DL** LDW-SC20-4-6DL LDW-SC23-4-6DL** LDW-SC15-4-6DL LDW-SC10-4-5DL LDW-SC25-4-6DL LDW-SC19-4-6DL LDW-SC49-4-6DL	All TCL compounds except Aroclor-1242 Aroclor-1254 Aroclor-1260	R	A
JH57	LDW-SC39-4-6	Aroclor-1260	R	A
JH57	LDW-SC39-4-6DL	All TCL compounds except Aroclor-1260	R	A

XIV. Field Replicates

Samples LDW-SC33-4-6** and LDW-SC201-4-6** and samples LDW-SC33-4-6DL** and LDW-SC201-4-6DL** were identified as field replicates. No polychlorinated biphenyls were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SC33-4-6**	LDW-SC201-4-6**	
JH57	Aroclor-1254	140	110	24 (≤50)
JH57	Aroclor-1260	120	240	67 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SC33-4-6DL**	LDW-SC201-4-6DL**	
JH57	Aroclor-1254	150	120	22 (≤50)
JH57	Aroclor-1260	130	220	51 (≤50)

XV. Field Blanks

No field blanks were identified in this SDG.

Lower Duwamish Waterway Group
Polychlorinated Biphenyls - Data Qualification Summary - SDGs JH57, JL31, JL32, JL33 and JL34

SDG	Sample	Compound	Flag	A or P	Reason
JH57	LDW-SC15-4-6 LDW-SC20-4-6 LDW-SC23-4-6** LDW-SC14-4.1-6**	All TCL compounds	J (all detects)	A	Surrogate recovery (%R)
JH57	LDW-SC39-4-6 LDW-SC12-4-6.7	All TCL compounds	J (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)
JH57	LDW-SC16-8-10**	All TCL compounds	J (all detects)	P	Surrogate recovery (%R)
JH57	LDW-SC41-4-6**	Aroclor-1254 Aroclor-1260	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)
JH57 JL31 JL33 JL34	LDW-SC45-5-6** LDW-SC2-4-6 LDW-SC33-1.5-2 LDW-SC12-2-2.5 LDW-SC44-.5-1	Aroclor-1260	J (all detects)	A	Compound quantitation and CRQLs (RPD)
JH57	LDW-SC26-11.1-12.1** LDW-SC33-4-6** LDW-SC201-4-6** LDW-SC12-4-6.7 LDW-SC14-4.1-6** LDW-SC2-4-6 LDW-SC46-4-6.8 LDW-SC45-5-6**	Aroclor-1254 Aroclor-1260	R R	A	Overall assessment of data
JH57	LDW-SC26-11.1-12.1DL** LDW-SC33-4-6DL** LDW-SC201-4-6DL** LDW-SC12-4-6.7DL LDW-SC14-4.1-6DL** LDW-SC2-4-6DL LDW-SC46-4-6.8DL LDW-SC45-5-6DL**	All TCL compounds except Aroclor-1254 Aroclor-1260	R	A	Overall assessment of data
JH57	LDW-SC8-6-8 LDW-SC16-4-6	Aroclor-1254	R	A	Overall assessment of data
JH57	LDW-SC8-6-8DL LDW-SC16-4-6DL	All TCL compounds except Aroclor-1254	R	A	Overall assessment of data
JH57	LDW-SC41-4-6** LDW-SC20-4-6 LDW-SC23-4-6** LDW-SC15-4-6 LDW-SC10-4-5 LDW-SC25-4-6 LDW-SC19-4-6 LDW-SC49-4-6	Aroclor-1242 Aroclor-1254 Aroclor-1260	R R R	A	Overall assessment of data

SDG	Sample	Compound	Flag	A or P	Reason
JH57	LDW-SC41-4-6DL** LDW-SC20-4-6DL LDW-SC23-4-6DL** LDW-SC15-4-6DL LDW-SC10-4-5DL LDW-SC25-4-6DL LDW-SC19-4-6DL LDW-SC49-4-6DL	All TCL compounds except Aroclor-1242 Aroclor-1254 Aroclor-1260	R	A	Overall assessment of data
JH57	LDW-SC39-4-6	Aroclor-1260	R	A	Overall assessment of data
JH57	LDW-SC39-4-6DL	All TCL compounds except Aroclor-1260	R	A	Overall assessment of data

Lower Duwamish Waterway Group
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDGs JH57, JL31, JL32, JL33 and JL34

No Sample Data Qualified in this SDG

Butyltins By EPA SW 846 Method 8270D using Selected Ion Monitoring (SIM) & 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.

II. GC/MS Instrument Performance Check

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

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 and system monitoring compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

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

V. Blanks

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

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

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 not within the QC limits. Since the samples were diluted out, no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

Standard reference material was performed at the required frequencies.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

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

XI. Target Compound Identifications

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

XII. Compound Quantitation and CRQLs

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

SDG	Sample	Compound	Finding	Criteria	Flag	A or P
JH57	LDW-SC26-6-8** LDW-SC25-4-6	Tributyltin ion	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A	A
JH57	LDW-SC28-5.5-7.5	Tributyltin ion Dibutyltin ion	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A	A

N/A = Not applicable

For the results above flagged "Not applicable", the affected compound results in the associated samples were deemed unusable and did not warrant qualification of the data.

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

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:

SDG	Sample	Compound	Flag	A or P
JH57	LDW-SC26-6-8** LDW-SC25-4-6	Tributyltin ion	R	A
JH57	LDW-SC26-6-8DL** LDW-SC25-4-6DL	All TCL compounds except Tributyltin ion	R	A
JH57	LDW-SC28-5.5-7.5	Tributyltin ion Dibutyltin ion	R R	A
JH57	LDW-SC28-5.5-7.5DL	All TCL compounds except Tributyltin ion Dibutyltin ion	R	A

XVI. Field Replicates

No field replicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

Lower Duwamish Waterway Group
Butyltins - Data Qualification Summary - SDG JH57

SDG	Sample	Compound	Flag	A or P	Reason
JH57	LDW-SC26-6-8** LDW-SC25-4-6	Tributyltin ion	R	A	Overall assessment of data
JH57	LDW-SC26-6-8DL** LDW-SC25-4-6DL	All TCL compounds except Tributyltin ion	R	A	Overall assessment of data
JH57	LDW-SC28-5.5-7.5	Tributyltin ion Dibutyltin ion	R R	A	Overall assessment of data
JH57	LDW-SC28-5.5-7.5DL	All TCL compounds except Tributyltin ion Dibutyltin ion	R	A	Overall assessment of data

Lower Duwamish Waterway Group
Butyltins - Laboratory Blank Data Qualification Summary - SDG JH57

No Sample Data Qualified in this SDG

Metals by EPA SW 846 Methods 6010B/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.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

SDG	Method Blank ID	Analyte	Maximum Concentration	Associated Samples
JH57	PB (prep blank)	Zinc	1.1 mg/Kg	LDW-SC26-6-8** LDW-SC26-11.1-12.1 LDW-SC37-5.3-6.9** LDW-SC28-5.5-7.5** LDW-SC33-4-6 LDW-SC6-6-8 LDW-SC8-4-6 LDW-SC16-4-6 LDW-SC16-8-10** LDW-SC25-4-6 LDW-SC2-4-6 LDW-SC2-10.7-12 LDW-SC17-6-8.2

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. The sample concentrations were either not detected or were significantly greater (>10X blank contaminants) than the concentrations found in the associated method blanks.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

SDG	Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JH57	LDW-SC26-6-8MS (LDW-SC26-6-8** LDW-SC26-11.1-12.1 LDW-SC37-5.3-6.9** LDW-SC28-5.5-7.5** LDW-SC33-4-6 LDW-SC6-6-8 LDW-SC8-4-6 LDW-SC16-4-6 LDW-SC16-8-10** LDW-SC25-4-6 LDW-SC2-4-6 LDW-SC2-10.7-12 LDW-SC17-6-8.2 LDW-SC26-6-8DUP)	Antimony	29.9 (70-130)	J (all detects) UJ (all non-detects)	A

Although the percent recovery of antimony was severely low (<30%) in the MS sample above, the results in all the associated samples were qualified as estimated (J/UJ) since the post spike recoveries for antimony were greater then 75%.

VI. Duplicate Sample Analysis

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

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 was performed at the required frequencies.

VIII. Internal Standards

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not performed for this SDG.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIII. Field Replicates

No field replicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

Lower Duwamish Waterway Group
Metals - Data Qualification Summary - SDGs JH57 and JL31

SDG	Sample	Analyte	Flag	A or P	Reason
JH57	LDW-SC26-6-8** LDW-SC26-11.1-12.1 LDW-SC37-5.3-6.9** LDW-SC28-5.5-7.5** LDW-SC33-4-6 LDW-SC6-6-8 LDW-SC8-4-6 LDW-SC16-4-6 LDW-SC16-8-10** LDW-SC25-4-6 LDW-SC2-4-6 LDW-SC2-10.7-12 LDW-SC17-6-8.2 LDW-SC26-6-8DUP	Antimony	J (all detects) UJ (all non-detects)	A	Matrix spike analysis (%R)

Lower Duwamish Waterway Group
Metals - Laboratory Blank Data Qualification Summary - SDGs JH57 and JL31

No Sample Data Qualified in this SDG

Total Organic Carbon by Plumb Method and Total Solids by EPA Method 160.3

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.

b. Calibration Verification

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

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

IV. Matrix Spike/Matrix Spike Duplicates

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

V. Duplicates

Duplicate (DUP) and Triplicate (TRP) sample analyses were reviewed for each matrix as applicable. Relative percent differences (RPD) and relative standard deviation (RSD) 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.

Standard reference material was performed at the required frequencies.

VII. Sample Result Verification

All sample result verifications were acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Replicates

Samples LDW-SC33-4-6** and LDW-SC201-4-6** were identified as field replicates. No concentrations were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (%)		RPD (Limits)
		LDW-SC33-4-6**	LDW-SC201-4-6**	
JK31	Total solids	60.40	57.10	6 (≤20)
JK31	Total organic carbon	2.10	2.13	1 (≤30)

X. Field Blanks

No field blanks were identified in this SDG.

Lower Duwamish Waterway Group
Wet Chemistry - Data Qualification Summary - SDGs JK31, JL31, JL32, JL33 and JL34

No Sample Data Qualified in this SDG

Lower Duwamish Waterway Group
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDGs JK31, JL31, JL32, JL33 and JL34

No Sample Data Qualified in this SDG

Revision 1

LDC Report# 15145A21

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Lower Duwamish Waterway Group

Collection Date: February 15 through February 22, 2006

LDC Report Date: December 19, 2006

Matrix: Sediment

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level IV

Laboratory: AXYS Analytical Services Ltd.

Sample Delivery Group (SDG): DPWG19451/WG19107

Sample Identification

LDW-SC26-6-8
LDW-SC20-4-6
LDW-SC20-4-6DUP

Introduction

This data review covers 3 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1613B for Polychlorinated Dioxins/Dibenzofurans.

This review follows the Lower Duwamish Waterway Group Final Subsurface Sediment Sampling for Chemical Analyses Quality Assurance Project Plan (February 3, 2006) and USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (August 2002).

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

The following are definitions of the data qualifiers:

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

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

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

A Indicates the finding is based upon technical validation criteria.

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

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between ^{13}C-2,3,7,8-TCDD and ^{13}C-1,2,3,4-TCDD was less than or equal to 25%.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all native compounds and less than or equal to 30.0% for all labelled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio was technically acceptable.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration concentrations were within the QC limits.

The ion abundance ratios for all PCDDs and PCDFs were within method criteria.

V. Blanks

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

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
WG19107-101	5/9/06	1,2,3,4,6,7,8-HpCDD OCDD OCDF Total HpCDD	0.070 ng/Kg 0.118 ng/Kg 0.076 ng/Kg 0.070 ng/Kg	All samples in SDG DPWG19451/WG19107

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. Matrix Spike/Matrix Spike Duplicates

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

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

VII. Laboratory Control Samples (LCS)

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

Standard reference material was performed at the required frequencies.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits.

X. Target Compound Identifications

All target compound identifications were within validation criteria.

*XI. Compound Quantitation and CRQLs

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

Sample	Compound	Flag	A or P
All samples in SDG DPWG19451/WG19107	All compounds reported by the lab as estimated (K) maximum possible concentration (EMPC)	U	A

XII. System Performance

The system performance was acceptable.

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:

Sample	Compound	Flag	A or P
All samples in SDG DPWG19451/WG19107	2,3,7,8-TCDF on DB-5	R	A

Data flags have been summarized at the end of the report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

Lower Duwamish Waterway Group
Dioxins/Dibenzofurans - Data Qualification Summary - SDG DPWG19451/WG19107

SDG	Sample	Compound	Flag	A or P	Reason
DPWG19451/ WG19107	LDW-SC26-6-8 LDW-SC20-4-6 LDW-SC20-4-6DUP	All compounds reported by the lab as estimated (K) maximum possible concentration (EMPC)	U	A	Compound quantitation and CRQLs (EMPC)
DPWG19451/ WG19107	LDW-SC26-6-8 LDW-SC20-4-6 LDW-SC20-4-6DUP	2,3,7,8-TCDF on DB-5	R	A	Overall assessment of data

Lower Duwamish Waterway Group
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG DPWG19451/WG19107

No Sample Data Qualified in this SDG

*Indicates change as the result of report review.

LDC #: 15115A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 6/23/06
SDG #: JH57 Level IV /II/ Page: 1 of 1
Laboratory: Analytical Resources, Inc. 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: 2/9 → 2/25/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD, r^2 ≥0.990
IV.	Continuing calibration	A	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples /SRM	A	LCS
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	not reported
XIV.	System performance	A	
XV.	Overall assessment of data	~~A~~SW	
XVI.	Field duplicates	SW	D = 5 + 6
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 sediments ** level IV

1	LDW-SC26-6-8 **	11	LDW-SC10-4-5	21	LDW-SC17-6-8.2	31	JHS7MBS1
2	LDW-SC26-6-8DL ** SX	12	LDW-SC16-4-6	22	LDW-SC17-6-8.2DL	32	
3	LDW-SC37-5.3-6.9 **	13	LDW-SC16-4-6DL SX	23	LDW-SC37-5.3-6.9MS	33	
4	LDW-SC28-5.5-7.5 **	14	LDW-SC16-8-10 **	24	LDW-SC37-5.3-6.9MSD	34	
5	LDW-SC33-4-6 **	15	LDW-SC23-4-6	25		35	
6	LDW-SC201-4-6 D **	16	LDW-SC32-5.2-8	26		36	
7	LDW-SC41-4-6 **	17	LDW-SC14-4.1-6	27		37	
8	LDW-SC6-6-8	18	LDW-SC203-4-6	28		38	
9	LDW-SC8-4-6	19	LDW-SC2-4-6	29		39	
10	LDW-SC8-6-8	20	LDW-SC2-10.7-12	30		40	

LDC #: 15115A29
SDG #: JH57

VALIDATION FINDINGS CHECKLIST

Reviewer:
2nd Reviewer:

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?	✓			
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 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) ≤ 25% and relative response factors (RRF) ≥ 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 duplicate				
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?	✓			

LDC #: 15115A29
SDG #: JH57

VALIDATION FINDINGS CHECKLIST

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

Validation Area	Yes	No	NA	Findings/Comments
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.	✓			
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 #: 15115A2a
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Blanks

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: 5/10/06 **Blank analysis date:** 5/16/06
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
	JH7MB51	19								
A	110	73/4								

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 #: 15115 A2a
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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	compound ~~Sample ID~~	Finding	Associated Samples	Qualifications
		UU, YY, ZZ	exceeded cal Range	1	NA
		YY, ZZ	↓	12, 21	NA
				~~ZZ~~	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15115 A2a
SDG #: J457

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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".

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~~ compd	Finding	Associated Samples	Qualifications
		uu, YY, ZZ	exceeded cal Range	1	R/A
		all except above	diluted	2	R/A
		yy, ZZ	exceeded cal Range	12, 21	R/A
		all except above	diluted	13, 22	R/A
		D, CC	8270SIM - lower RLs	All except DLs	↓

Comments:

OVR.2S

LDC#: 15115A2a
SDG#: JH57

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: GC/MS SVOAs (EPA SW846 8270-SIM)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/Kg)		≤150 RPD	
	5	6		
Naphthalene	410	380	8	
2-Methylnaphthalene	63	82	26	
Acenaphthene	1000	710	34	
Dibenzofuran	380	280	30	
Fluorene	630	510	21	
Phenanthrene	1400	1300	7	
Anthracene	420	490	15	
Fluoranthene	3200	5000	44	
Pyrene	2600	4700	58	
Benzo (a) anthracene	610	780	24	
bis (2-Ethylhexyl) phthalate	56	65u	F1 ~~200~~ NC	
Chrysene	560	900	47	
Benzo (b) fluoranthene	380	650	52	
Benzo (k) fluoranthene	250	440	55	
Benzo (a) pyrene	270	500	60	
Indeno (1,2,3-cd) pyrene	84	180	73	
Benzo (g,h,i) perylene	110	210	63	
1-Methylnaphthalene	76	110	37	

SDG #: J1457

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 (25 std)	Recalculated RRF (25 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	5/1/06	Phenol (1st internal standard)	2.37598	2.37598	2.36768	2.368	4.927	4.93
			Naphthalene (2nd internal standard)	1.14679	1.14679	1.21274	1.213	3.929	3.93
			Fluorene (3rd internal standard)	1.39425	1.39425	1.47019	1.470	3.742	3.74
			Pentachlorophenol (4th internal standard)	0.15985	0.15985	0.16073	0.161	6.886	6.89
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.53232	0.53232	0.52627	0.526	13.523	13.52
			Benzo(a)pyrene (6th internal standard)	1.26098	1.26098	1.26103	1.261	12.375	12.375
2			Anthracene-d10 (1st internal standard)	1.21962	1.2196	1.27420	1.274	5270	5.270
			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 #: 15115A2a
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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	CCV	5/16/06	Phenol (1st internal standard)	2.36768	2.26787	2.26787	4.21517	4.215
		1048	Naphthalene (2nd internal standard)	1.21274	1.25328	1.25328	3.34281	3.34
			Fluorene (3rd internal standard)	1.47019	1.48023	1.48023	0.68266	0.683
			~~Anthracene~~ Pentachlorophenol (4th internal standard)	1.27420	1.30270	1.30270	2.23682	2.237
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.52627	0.54002	0.54002	2.61343	2.613
			Benzo(a)pyrene (6th internal standard)	1.26103	1.33976	1.33976	6.24301	6.24
2	CCV	5/17/06	Phenol (1st internal standard)		2.27244	2.272	4.02245	4.022
		11:35	Naphthalene (2nd internal standard)		1.21538	1.215	0.21746	0.217
			Fluorene (3rd internal standard)		1.44294	1.443	1.85379	1.854
			~~Anthracene~~ Pentachlorophenol (4th internal standard)		1.28802	1.288	1.08521	1.085
			Bis(2-ethylhexyl)phthalate (5th internal standard)		0.53760	0.538	2.15307	2.153
			Benzo(a)pyrene (6th internal standard)		1.29657	1.296	2.81807	2.818
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 #: 15115 A2a
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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	1631	1265	77.6	77.65	0
2-Fluorobiphenyl	1631	1252	76.8	76.74	
Terphenyl-d14	1631	1087	66.8	66.6	
Phenol-d5	2447	1881	76.8	76.88	
2-Fluorophenol	2447	1870	76.5	76.44	
2,4,6-Tribromophenol	2447	1893	77.3	77.37	
2-Chlorophenol-d4	2447	1823	74.4	74.51	
1,2-Dichlorobenzene-d4	1631	1068	65.6	65.45	↓

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 #: 15115A2a
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: B
2nd Reviewer: [illegible]

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

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

%Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = | MS - MSD | * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 23 + 24

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
Phenol	2460	2450		1530	1430	62.2	65.2	58.4	58.4	6.8	6.8
2-Chlorophenol	2460	2450		1700	1590	69.1	69.1	64.9	64.9	6.7	6.7
1,4-Dichlorobenzene											
N-Nitroso-di-n-propylamine											
1,2,4-Trichlorobenzene											
4-Chloro-3-methylphenol	2460	2450		1740	1660	70.7	70.7	67.8	67.8	4.7	4.7
Acenaphthene	1640	1630		1160	1130	70.7	70.7	69.3	69.3	2.6	2.6
4-Nitrophenol	2460	2450		2080	1980	84.6	84.6	80.8	80.8	4.9	4.9
2,4-Dinitrotoluene	1640	1630		1080	1030	65.9	65.9	63.2	63.2	4.7	4.7
Pentachlorophenol											
Pyrene	1640	1630	134	1400	1450	77.2	77.2	80.7	80.7	3.5	3.5

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 #: 15115A2a
SDG #: JH57

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

Reviewer: [illegible]
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: 060309AG LCS

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	1670	NA	1100	NA	65.9	65.9				
2-Chlorophenol	↓	↓	1090	↓	65.3	65.3				
1,4-Dichlorobenzene										
N-Nitroso-di-n-propylamine										
1,2,4-Trichlorobenzene										
4-Chloro-3-methylphenol	1670	NA	1210	NA	72.5	72.5				
Acenaphthene			1160		69.5	69.5				
4-Nitrophenol			1540		92.2	92.2				
2,4-Dinitrotoluene	↓	↓	1140	↓	68.3	68.3				
Pentachlorophenol										
Pyrene	1670	NA	1310	NA	78.3	78.3	NA			

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 #: 15115A2a
SDG #: J457

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 . Naphthalene

Conc. = $\frac{(97416)(20)(2)(1000)(\quad)}{(486348)(1.213)(30.6)(\quad)(\quad)}$

= 220 ug/kg

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

LDC #: 15238A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 7/25/06
SDG #: JL31/~~JL32~~/JL33/JL34 Level III Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer:
2nd Reviewer:

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

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: 2/9/06 - 2/22/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	% RSD, r^2 ≥ 0.990
IV.	Continuing calibration	A	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples /SRM	SW	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	SW	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	~~A~~ 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
Sediments

1	LDW-SC1-0-.5	11	LDW-SC23-3-3.5	21	MB-060206	31	
2	LDW-SC1-.5-1	12	LDW-SC23-3-3.5DL	22		32	
3	LDW-SC1-1-1.5	13	LDW-SC23-3.5-4	23		33	
4	LDW-SC1-1.5-2	14	LDW-SC23-3.5-4DL	24		34	
5	LDW-SC23-0-0.5	15	LDW-SC51-0-0.5	25		35	
6	LDW-SC23-0.5-1	16	LDW-SC51-0.5-1	26		36	
7	LDW-SC23-1-1.5	17	LDW-SC51-1-1.5	27		37	
8	LDW-SC23-1.5-2	18	LDW-SC51-1.5-2	28		38	
9	LDW-SC23-2-2.5	19	LDW-SC1-.5-1MS	29		39	
10	LDW-SC23-2.5-3	20	LDW-SC1-.5-1MSD	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 #: 15238A29
SDG #: JL31/32/33/34

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: 6/12/06 **Blank analysis date:** 6/21/06
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
	MB-061206	1	5	6	15					
A	290	70U	400U	65U	96U					

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 #: 15238A2a
SDG #: JL31/~~32~~/33/34

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
		LCS-061206	T	38.9 (40-130)	( )	( )	All samples	J/UJ/P
			NNN	22.9 (↓)	( )	( )	↓	↓
				( )	( )	( )	— — —	—
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 15238A2a
SDG #: JL31 | 32/33/34

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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~~ Compound	Finding	Associated Samples	Qualifications
		UU, VV, YY, ZZ,	exceeded cal range	11	NA
		CCC, DDD			
		YY	↓	13	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: [illegible]
SDG #: 1L31/32/33/34

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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
		UU, VV, YY, ZZ, CCC, DDD	exceeded cal Range	11	R/A
		all except above	diluted	12	R/A
		YY	exceeded cal Range	13	R/A
		all except above	diluted	14	R/A
		— — — —			

Comments:

LDC #: 15115A2b

VALIDATION COMPLETENESS WORKSHEET

Level IV / III

Date: 6/22/06

SDG #: JH57

Page: 1 of 1

Laboratory: Analytical Resources, Inc.

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: 2/9 - 2/27/06a 2/25/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples / SRM	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	SW	
XIII.	Tentitatively identified compounds (TICs)	N	not reported
XIV.	System performance	A	
XV.	Overall assessment of data	ASW	
XVI.	Field duplicates	SW	D = 5 + 6
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

Sediment

for level IV

1	LDW-SC26-6-8 ***	11	LDW-SC8-6-8	21	LDW-SC203-4-6	31	JH57MBS1
2	LDW-SC26-6-8DL *** SX	12	LDW-SC8-6-8RE	22	LDW-SC203-4-6RE	32	
3	LDW-SC37-5.3-6.9 ***	13	LDW-SC10-4-5	23	LDW-SC2-4-6	33	
4	LDW-SC28-5.5-7.5 **	14	LDW-SC16-4-6	24	LDW-SC2-10.7-12	34	
5	LDW-SC33-4-6 ** D	15	LDW-SC16-4-6DL	25	LDW-SC17-6-8.2	35	
6	LDW-SC201-4-6 D ***	16	LDW-SC16-8-10 **	26	LDW-SC17-6-8.2DL	36	
7	LDW-SC41-4-6 **	17	LDW-SC23-4-6	27	LDW-SC37-5.3-6.9MS	37	
8	LDW-SC6-6-8	18	LDW-SC32-5.2-8	28	LDW-SC37-5.3-6.9MSD	38	
9	LDW-SC8-4-6	19	LDW-SC14-4.1-6	29		39	
10	LDW-SC8-4-6RE	20	LDW-SC14-4.1-6RE	30		40	

VALIDATION FINDINGS WORKSHEET

ANT
CRY
PRY

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,l)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 #: 15115A26
SDG #: JH57

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
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?		✓		
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) > 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) ≤ 25% and relative response factors (RRF) ≥ 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?	✓			
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?				

LDC #: 15115A26
SDG #: JH57

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: B

Validation Area	Yes	No	NA	Findings/Comments
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.	✓			
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 #: 15115A26
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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 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
	5/18/06 1043	CCV	0	35.72017		1, 4→7, 9, 11, 14, 16→19, 21, 25	J/UJ/A
	5/19/06 1156	CCV	J	32.5		2, 10, 12, 15, 20, 22, 26	J/UJ/P
			R	89.9			
			U (CCC)	26.2 (20)			
			CC	79.7			
			R		0.03227		J/UJ/A

CONCAL2S

LDC #: 15113 R2U

SDG #: J457

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
		11	FBP	183 (40-130)	no QUAL
			TBP	196 (↓)	↓
				( )	
				( )	
				( )	
				( )	
		14	FBP	186 (↓)	↓
			TBP	167 (↓)	↓
				( )	
				( )	
				( )	
				( )	
		25	FBP	138 (↓)	↓
			TBP	171 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* 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*

LDC #: 15115 A26
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Internal Standards

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

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

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		25	ANT	276496 (286380-1145522)		J/UJ/A qual CC
			CRY	611047 (147566-590266)		J/A dil AAA
		14	↓	261575 (↓)		J/UJ/A CC
			↓	702517 (↓)		J/A dil AAA
		19	CRY	685000 (↓)		J/A dil AAA
			PRY	720075 (178804-715218)		↓ KKK, ~~CCC~~
		21	CRY	708757 (↓)		J/A dil AAA
		9	↓	715010 (↓)		J/A dil AAA
		11	CRY	923397 (↓)		J/A dil AAA
			PRY	746730 (↓)		↓ KKK, ~~CCC~~
		1	↓	763575 (↓)		J/A dil AAA
			↓	733567 (↓)		↓ KKK, ~~CCC~~

* QC limits are advisory

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

LDC #: 15115A26
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: B
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 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	compound ~~Sample ID~~	Finding	Associated Samples	Qualifications
		TT	Exceeded cal Range	1	NA

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15115A26
SDG #: JH57

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	compd Sample ID	Finding	Associated Samples	Qualifications
		TT	exceeded cal Range	1	R/A
		all except above	diluted	2	R/A
		~~AAA~~ P3	~~IS out~~	9	R/A
		KKK, TT	lower Result	↓	
		QQ	higher RL		
		all except ~~AAA~~ P7, KKK, TT, QQ		10	R/A
		KKK, ~~QQQ~~ P8	IS failed	11	R/A
		G, TT	lower result	↓	↓
		QQ, X	higher RL		
		all except Above		12	R/A

Comments: _____

OVR.2S

LDC #: 15115A25
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: JS
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~~ compound	Finding	Associated Samples	Qualifications
		~~cc~~	~~IS out + higher RL~~	~~14~~ R	~~R/A~~ A
		~~All except cc~~		~~15~~	~~R/A~~ R
		KKK, AAA	IS out, lower result	19	R/A
		QQ	higher RL	↓	
		All excep KKK, AAA, QQ		20	R/A
		KKK	lower result	21	R/A
		AAA - - -	IS out	↓	↓
		QQ	higher RL	↓	↓
		Q	CCV out	↓	
		All except KKK, AAA, QQ, Q		22	R/A
		All cpds		15, 26	↓

Comments: _____

OVR.2S

LDC#: 15115A2b **VALIDATION FINDINGS WORKSHEET** Page: 1 of 1
SDG#: JH57 **Field Duplicates** Reviewer: RD
2nd Reviewer: MC

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

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/Kg)		≤ 1/30 RPD	
	5	6		
Dibenz (a,h) anthracene	57	100	55	
1,4-Dichlorobenzene	5.9	3.9	41	
Pentachlorophenol	36	36	0	
2,4-Dimethylphenol	6.5u	6.5	~~200~~ NC	

V:\FIELD DUPLICATES\11025_PAHs\15115A2b.wpd

LDC #: [illegible]
SDG #: JH57

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 (2.5 std)	Recalculated RRF (2.5 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL - NT2	5/17/06	1,3 Dichlorobenzene						
			Phenol (1st internal standard)	1.941	1.941	1.749	1.749	8.1	8.1
			2,4-Dimethylphenol						
			Naphthalene (2nd internal standard)	0.354	0.354	0.308	0.308	9.7	9.7
			Dimethylphthalate						
			Fluorene (3rd internal standard)	0.720	0.720	0.656	0.656	5.5	5.5
			Hexachlorobenzene						
			Pentachlorophenol (4th internal standard)	0.223	0.223	0.201	0.201	6.3	6.3
			Butylbenzylphthalate						
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.6066	0.606	0.477	0.477	19.7	19.7
			Benzo(a)anthracene						
			Benzo(a)pyrene (6th internal standard)	0.851	0.851	0.743	0.743	9.7	9.7
2			Phenol (1st internal standard)	0.993	0.993	0.864	0.864	8.9	8.9
			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 #: 15115A26
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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	5/18/06	10:43	~~Phenol~~ (1st internal standard)	1.74897	1.39401	1.394	20.295	20.3
	CCV	5/18/06	~~Naphthalene~~ (2nd internal standard)	0.30845	0.19827	0.198	35.72	35.7
			~~Fluorene~~ (3rd internal standard)	0.65598	0.61271	0.613	6.597	6.59
			~~Pentachlorophenol~~ (4th internal standard)	0.20113	0.20528	0.205	2.06167	2.06
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard)	0.47767	0.51244	0.512	7.27913	7.27
			~~Benzo(a)pyrene~~ (6th internal standard)	0.8645	1.05505	1.06	22.03518	22.03
2	5/19/06	11:56	~~Phenol~~ (1st internal standard)		1.45912	1.46	16.5727	16.5
	CCV	10:43	Naphthalene (2nd internal standard)		0.24803	0.248	19.58851	19.6
			~~Fluorene~~ (3rd internal standard)		1.17868	1.178	79.68	79.7
			~~Pentachlorophenol~~ (4th internal standard)		0.19596	0.196	2.57199	2.6
			~~Bis(2-ethylhexyl)~~phthalate (5th internal standard)		0.56385	0.564	18.04170	18.0
			Benzo(a)pyrene (6th internal standard)		0.91377	0.914	5.6932	5.7
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 #: 15115A26
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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	1628	1683	103	103	0
2-Fluorobiphenyl	1628	2162	133	133	
Terphenyl-d14	1628	947.9	58.4	58.2	
Phenol-d5	2442	1684	69.1	69.0	
2-Fluorophenol	2442	1581	64.8	64.74	
2,4,6-Tribromophenol	2442	2607	107	107	
2-Chlorophenol-d4	2442	1534	62.9	62.81	
1,2-Dichlorobenzene-d4	1628	994.1	61.2	61.1	

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 #: 19115M2D
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

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 = | MS - MSD | * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 27 28

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
Phenol											
2-Chlorophenol											
1,4-Dichlorobenzene	162	163	ND	113	103	69.8	69.8	63.2	63.2	9.3	9.3
N-Nitroso-di-n-propylamine	162	163	ND	123	106	75.9	75.9	65.0	65.0	14.8	14.8
1,2,4-Trichlorobenzene	162	163	ND	127	123	78.4	78.4	75.5	75.5	3.2	3.2
4-Chloro-3-methylphenol											
Acenaphthene											
4-Nitrophenol											
2,4-Dinitrotoluene											
Pentachlorophenol	243	245	ND	259	262	107	107	107	107	1.2	1.2
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 #: 15115A26
SDG #: JH57

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

Reviewer: [illegible]
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: ~~0603094C~~ LCS-051006

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										
2-Chlorophenol										
1,4-Dichlorobenzene	167	NA	117	NA	70.1	70.1				
N-Nitroso-di-n-propylamine	167	↓	124	↓	74.3	74.3				
1,2,4-Trichlorobenzene	167	↓	137	↓	82.0	82.0				
4-Chloro-3-methylphenol										
Acenaphthene										
4-Nitrophenol										
2,4-Dinitrotoluene										
Pentachlorophenol	167	NA	155	NA	92.8	92.8	NA			
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 #: 15115A26
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: A
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 . Dibenzo(a,h)anthracene

Conc. = $\frac{(195\,9848)(2)(2)(1000)(\quad)}{(733567)(0.846)(30.7)(\quad)(\quad)}$

=

400 ug/kg

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

LDC #: 15238A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/25/06
SDG #: JL31/~~JL32~~JL33/JL34 Level III Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270~~C~~D-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: 2/9/06 - 2/22/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD, r^2 ≥0.990
IV.	Continuing calibration	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples /SRM	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
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
sediments

1	LDW-SC1-0-.5	11	LDW-SC23-0.5-1	21	LDW-SC51-0-0.5	31	MB-061206
2	LDW-SC1-0-.5DL	12	LDW-SC23-0.5-1DL	22	LDW-SC51-0.5-1	32	
3	LDW-SC1-.5-1	13	LDW-SC23-1-1.5	23	LDW-SC51-1-1.5	33	
4	LDW-SC1-.5-1DL	14	LDW-SC23-1-1.5DL	24	LDW-SC51-1.5-2	34	
5	LDW-SC1-1-1.5	15	LDW-SC23-1.5-2	25	LDW-SC1-.5-1MS	35	
6	LDW-SC1-1-1.5DL	16	LDW-SC23-1.5-2DL	26	LDW-SC1-.5-1MSD	36	
7	LDW-SC1-1.5-2	17	LDW-SC23-2-2.5	27		37	
8	LDW-SC1-1.5-2DL	18	LDW-SC23-2.5-3	28		38	
9	LDW-SC23-0-0.5	19	LDW-SC23-3-3.5	29		39	
10	LDW-SC23-0-0.5DL	20	LDW-SC23-3.5-4	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 #: 15238A26
SDG #: J L31/~~32~~/33/34
METHOD: GC/MS BNA (EPA SW 846 Method 8270)

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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 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
	6/20/06	CC0620	G	57.8		17 → 24	J/UJ/A
			O	29.6		2, 4, 6, 8, 10,	
			R	26.3		12, 14	

CONCAL.2S

LDC #: 15 [illegible]
SDG #: JL 31/32/33/34

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
		3	NBZ	37.8 (40-130)	NO QUAL
				( )	
		5	↓	37.0 (↓)	↓
				( )	
		7	↓	28.0 (↓)	↓
				( )	
		8 9	↓	29.3 (↓)	↓
				( )	
		11	↓	29.3 (↓)	↓
				( )	
		13	↓	25.8 (↓)	↓
				( )	
		15	↓	29.6 (↓)	↓/NJ/A QUAL All BASE
			FBP	38.4 (↓)	~~D~~, E, ~~F~~, QQQ, J, R, U, ~~KK~~, QQ, SS, AAA, KKK, OOO
				( )	
		19	FBP	33.5 (40-130)	NO QUAL
			TBP	37.1 (↓)	↓
				( )	
		20	FBP	33.0 (↓)	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 #: 15238A26
SDG #: JL31/32/33/34

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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 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
		25 + 26	R	28.5 (40-130)	32.8 (40-130)	( )	3, 4	J/UJ/A
			J	0 (40-130)	0 (40-130)	( )	↓	J/UJ/R/A
				( )	( )	( )		
				( )	( )	( )	— — —	—
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	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 #: 15238A26
SDG #: JL31/32/33/34

VALIDATION FINDINGS WORKSHEET
Internal Standards

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

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		1	CRY	5916775 (126152-504606)		J (all) / A (AAA)
			PRY	683744 (145432-581726)		(KKK)
		3	PRY	683648 (↓)		(KKK)
		5	PHN	6616 32 (160778-643110)		QQ, SS, TT
			CRY	638406 (126152-504606)		AAA
		7	PHN	647040 (↓)		↓
			CRY	615323 (↓)		↓
			PRY			
		9	CRY	556060 (126152-504606)		AAA
			PRY	618937 (145432-581726)		KKK
		11	CRY	619712 (↓)		↓
			PRY	620519 (↓)		↓
		13	CRY	592829 (↓)		↓
			PRY	593044 (↓)		↓ ↓
		Note # 15 - 1Standard . Di-n-octylphthalate-d4 (no associated compd)				

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

LDC #: [illegible]
SDG #: JL31/~~32~~/33/34

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: B
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	compound ~~Sample ID~~	Finding	Associated Samples	Qualifications
		All	diluted	2, 4, 6, 8, 10,	R/A
				12, 14, 16	
		— — — —			

Comments:

OVR.2S

LDC #: 15115A3b

VALIDATION COMPLETENESS WORKSHEET

Level IV / III

Date: 6/22/06

SDG #: JH57

Page: 1 of 2

Laboratory: Analytical Resources, Inc.

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: 2/6 → 2/25/06
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples /SRM	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	~~Florisil cartridge check~~ IS	N	All internal std OK
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	SW	Sulfur + Acid clean-up performed
XIV.	Field duplicates	SW	D = 9+11 10+12
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 ** level W

1 3	LDW-SC26-6-8 **	11 1	LDW-SC201-4-6 D **	(21) 1	LDW-SC39-4-6	(33) 3	LDW-SC16-4-6		
2 1	LDW-SC26-11.1-12.1 **	12	LDW-SC201-4-6DL D ** 10X	22	LDW-SC39-4-6DL 10X	32	LDW-SC16-4-6DL 3X		
3	LDW-SC26-11.1-12.1DL ** 5X	13 1	LDW-SC41-4-6 **	(23) 1	LDW-SC12-4-6.7	(33) 1	LDW-SC16-8-10 **		
4 1	LDW-SC51-3.8-5.8 **	14	LDW-SC41-4-6DL ** 10X	24	LDW-SC12-4-6.7DL 10X	(34) 1	LDW-SC23-4-6 **		
5 1	LDW-SC37-5.3-6.9 **	15 1	LDW-SC45-5-6 **	25 1	LDW-SC6-6-8	35	LDW-SC23-4-6DL ** 20X		
6 3	LDW-SC28-5.5-7.5 **	16	LDW-SC45-5-6DL ** 3X	26 3	LDW-SC8-4-6	36 3	LDW-SC21-4-6.2 **		
7 1	LDW-SC1-4-6 **	17 1	LDW-SC15-4-6	27 3	LDW-SC8-6-8	37 1	LDW-SC32-5.2-8 **		
8 1	LDW-SC4-4-6 **	18	LDW-SC15-4-6DL 50X	28	LDW-SC8-6-8DL 3X	38 1	LDW-SC14-4.1-6 **		
9 1	LDW-SC33-4-6 ** D	(19) 1	LDW-SC20-4-6	29 1	LDW-SC10-4-5	39	LDW-SC14-4.1-6DL ** 10X		
10	LDW-SC33-4-6DL ** D 10X	20	LDW-SC20-4-6DL 10X	30	LDW-SC10-4-5DL 5X	40 1	LDW-SC203-4-6 **		

LDC #: 15115A3b

VALIDATION COMPLETENESS WORKSHEET

SDG #: JH57

Level IV

Laboratory: Analytical Resources, Inc.

Date: 6/22/06

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		Sampling dates:
II.	GC/ECD Instrument Performance Check		
III.	Initial calibration		
IV.	Continuing calibration		
V.	Blanks		
VI.	Surrogate spikes		
VII.	Matrix spike/Matrix spike duplicates		
VIII.	Laboratory control samples /SRM		
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification		
XII.	Compound quantitation and reported CRQLs		
XIII.	Overall assessment of data		
XIV.	Field duplicates		
XV.	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:

41 2	LDW-SC25-4-6	51 2	LDW-SC49-4-6	61 1	JH57MBS1	71	5/4/06
42	LDW-SC25-4-6DL 20X	52	LDW-SC49-4-6DL	62 2	JH57MBS3	72	5/5/06
43 2	LDW-SC2-4-6	53 1	LDW-SC4-4-6MS	63 3	JH57MBS2	73	
44	LDW-SC2-4-6DL 10X	54 1	LDW-SC4-4-6MSD	64		74	
45 2	LDW-SC2-10.7-12	55 3	LDW-SC16-4-6MS	65		75	
46 2	LDW-SC17-6-8.2	56 3	LDW-SC16-4-6MSD	66		76	
47 2	LDW-SC19-4-6	57 2	LDW-SC2-10.7-12MS	67		77	
48	LDW-SC19-4-6DL 10X	58 2	LDW-SC2-10.7-12MSD	68		78	
49 2	LDW-SC46-4-6.8	59		69		79	
50	LDW-SC46-4-6.8DL 5X	60		70		80	

LDC #: 15115A36
SDG #: JH57

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
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%.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 #: 15115A36
SDG #: JH57

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: A

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?			✓	

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 #: 15115A36
SDG #: JH57

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: ~~GC~~ ___ HPLC

Are surrogates required by the method? Yes___ or No___.

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

Y N N/A Were surrogates spiked into all samples and blanks?

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

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	10, 12, 18, 20, 22		DCB	NR (50-150)	NO QUAL >2x. DIL
	24, 32, 35, 39,			( )	
	42			( )	
				( )	
	17	ZB5	DCB	201 (50-150)	J/A det
				( )	
	19	ZB35	↓	249.9 ( )	↓
				( )	
				( )	
	21	ZB35	DCB	232.8 ( )	J/UJ/A
		↓	TCMX	43.8 ( )	
				( )	
	23	ZB35	DCB	549.5 ( )	J/UJ/A
		ZB5	TCMX	42.2 ( )	
				( )	
	33	ZB35	DCB	195 ( )	J/P det
				( )	
	34	ZB-5	↓	207 ( )	J/A det
				(V)	
	38	ZB-5	↓	236 (V)	J/A det
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 15115A36
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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
	55 + 56 (3x)	V	143 (50-150)	163 (50-150)	( )	31, 32	no QUAL ~~3x~~
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 15115A36
SDG #: JH57

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
	AA, BB	exceeded cal range	2, 9, 11, 13, 19, 23, 34, 38, 43, 49	NA
	AA	↓	15, 27, 31	NA
	Y, AA, BB	↓	17, 29, 41, 47, 51	NA
	BB	↓	21	NA

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15115 A36
SDG #: JH57

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 But column Finding ≤ 40	Associated Samples	Qualifications
	AA	53	13	J/A dt
	BB	51	↓	↓
	BB	61	15	↓
	BB	46	43	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15115A36
SDG #: 1457

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
	AA, BB	Exceeded cal range	2, 9, 11, 13, 19, 23, 34, 38, 43, 49, 15	R/A
	All except above	diluted	3, 10, 12, 24, 39, 44, 50, 16	R/A
	Y	ND	13, 19, 34	R/A
	Y	ND	13, 19, 34	
	All except AA, BB, Y	diluted	14, 20, 35	R/A
	AA	exceeded cal range	15, 27, 31	R/A
	All except AA	diluted	16, 28, 32	R/A
	Y, AA, BB	exceeded cal range	17, 29, 41, 49, 51	R/A
	all except Above	diluted	18, 30, 42, 48, 52	R/A

Comments: _____

LDC #: 15115A36
SDG #: JH57

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
	BB	exceeded cal range	21	R/A
	All except Above	diluted	22	R/A

Comments: _____

LDC #: 15115A35
SDG #: JH57

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
	The pattern of peaks on detected samples were possibly			Text
	weathered aroclors. The results were reported by the			
	laboratory on the best possible match.			

Comments: _____

LDC #: 15115A3b
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: EZ
2nd reviewer: [illegible]

METHOD: ___ GC ___ HPLC

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

Compound	Concentration (ug/kg)		%RPD Limit ≤ 150	Qualification Parent only / All Samples
	9	11		
AA	140	110	24	
BB	120	240	67	

Compound	Concentration (ug/kg)		%RPD Limit ≤ 150	Qualification Parent only / All Samples
	10	12		
AA	150	120	22	
BB	130	220	51	

LDC #: 15115A3b
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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 (25 std)	Recalculated CF (25 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL ZB5	4/19/06	Aroclor 1260	0.0530	0.0530	0.0540	0.0540	8.5	8.5
2	ICAL ZB35	4/19/06	↓	0.0571	0.0571	0.0573	0.0573	7.7	7.7
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 #: 15115A36
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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	CCV 1025	5/8/06	1260-1 ZB5	5000	421.7	421.7	15.6	15.6
			ZB35	↓	468.8	468.8	6.2	6.2
2	CCV 1708	5/8/06	1260-1 ↓	↓	430.1	430.1	14.0	14.0
			↓	↓	451.5	451.5	9.7	9.7
3	CCV 1032	5/9/06	1260-1 ↓	↓	482.4	482.4	3.5	3.5
			↓	↓	450.3	450.3	9.9	9.9
4	CCV 1621	5/9/06	1260-1 ↓	↓	513.0	513.0	2.6	2.6
			↓	↓	488.5	488.5	2.3	2.3

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 #: 15115A36
SDG #: JH57

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	CCV 1020	5/10/06	1260-1 2B-5	500	507.3	507.3	1.5	1.5
			2B 35	↓	516.5	516.5	3.3	3.3
2	CCV 1941	5/10/06	1260 ↓	↓	498.9	498.9	0.2	0.2
			↓	↓	513.7	513.7	2.7	2.7
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 #: 15115A36
SDG #: JH57

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	
DCB	ZB35	40	41.6	104	104	0
TCMX	ZB5	40	29.8	74.5	74.5	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 #: 15115A36
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

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 concentration SA = Spike added SC = Sample concentration

RPD =(((SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 53 + 54

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)											
Aroclor 1260	19.8	19.5	ND	14.6	13.1	73.7	73.7	67.2	67.2	10.8	10.8

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 #: 15115A36
SDG #: JH57

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

Page: 1 of 1
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 concentration, SA = Spike added, SC = Sample concentration

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100 LCS = Laboratory Control Sample percent recovery LCSD = Laboratory Control Sample duplicate percent recovery

LCS/LCSD samples: LCS-050406

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	20.2	NA		14.7	NA	72.8	72.8	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 #: 15115A3b
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [signature]
2nd Reviewer: [signature]

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= $\frac{(A)(Fv)(Df)}{(RF)(Vs\ or\ Ws)(\%S/100)}$

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 1260

Concentration = $\frac{358 \times 5}{2.92}$

= 610 ug/kg

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications
2B35	1260-1 = $\frac{1909.61}{9462230}$	($\frac{80}{0.0573}$) = 281.7			
	1260-1 + 2 + 3 + 4 + 5 / 5 =	$\frac{281.7 + 487.4 + 427.9}{5}$	+ 289.9 + 303.1	= 358	

Comments: ______________________________

SAMPCALew.wpd

LDC #: 15238A3b

SDG #: JL31/JL32/JL33/JL34

Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 7/24/06

Page: 1 of 2

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: 2/9 → 2/21/06
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples / SRM	A	LCS
IX.	Regional quality assurance and quality control	N	Internal std. Acceptable
Xa.	Florisil cartridge check	N	Sulfur + Acid clean up performed
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 1	LDW-SC1-0-.5	11 1	LDW-SC6-3-3.5	21 2	LDW-SC13-.5-1	31 2	LDW-SC27-2-2.5
2 1	LDW-SC1-.5-1	12 1	LDW-SC6-3.5-4	22 2	LDW-SC13-1-1.5	32 2	LDW-SC27-2.5-3
3 1	LDW-SC1-1-1.5	13 1	LDW-SC6-4-4.5	23 2	LDW-SC13-1.5-2	33 2	LDW-SC27-3-3.5
4 1	LDW-SC1-1.5-2	14 1	LDW-SC33-0-0.5	24 2	LDW-SC13-2-2.5	34 2	LDW-SC27-3.5-4
5 1	LDW-SC6-0-0.5	15 1	LDW-SC33-0.5-1	25 2	LDW-SC13-2.5-3	35 2	LDW-SC27-4-4.5
6 1	LDW-SC6-0.5-1	16 1	LDW-SC33-1-1.5	26 2	LDW-SC13-3-3.5	36 3	LDW-SC12-0-.5
7 1	LDW-SC6-1-1.5	17 1	LDW-SC33-1.5-2 ✓	27 2	LDW-SC27-0-0.5	37 3	LDW-SC12-.5-1
8 1	LDW-SC6-1.5-2	18 1	LDW-SC33-2-2.5	28 2	LDW-SC27-0.5-1	38 3	LDW-SC12-1-1.5
9 1	LDW-SC6-2-2.5	19 1	LDW-SC33-2.5-3	29 2	LDW-SC27-1-1.5	39 3	LDW-SC12-1.5-2
10 1	LDW-SC6-2.5-3	20 2	LDW-SC13-0-.5	30 2	LDW-SC27-1.5-2	40 3	LDW-SC12-2-2.5 ✓

LDC #: 15238A3b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/06
SDG #: JL31/JL32/JL33/JL34 Level III Page: 2 of 2
Laboratory: Analytical Resources, Inc. 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		Sampling dates:
II.	GC/ECD instrument Performance Check		
III.	Initial calibration		
IV.	Continuing calibration		
V.	Blanks		
VI.	Surrogate spikes		
VII.	Matrix spike/Matrix spike duplicates		
VIII.	Laboratory control samples		
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		
XIV.	Field duplicates		
XV.	Field blanks		

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:

41	LDW-SC12-2.5-3	51	LDW-SC33-2-2.5MS	61	~~MB-061306~~	71	
42	LDW-SC12-3-3.5	52	LDW-SC33-2-2.5MSD	62	JL31MBS1	72	
43	LDW-SC12-3.5-4	53	LDW-SC13-0-.5MS	63	JL32MBS1	73	
44	LDW-SC44-0-.5	54	LDW-SC13-0-.5MSD	64	JL33MBS1	74	
45	LDW-SC44-.5-1	55	LDW-SC12-0-0.5MS	65		75	
46	LDW-SC44-1-1.5	56	LDW-SC12-0-0.5MSD	66		76	
47	LDW-SC44-1.5-2	57		67		77	
48	LDW-SC44-2-2.5	58		68		78	
49	LDW-SC44-2.5-3	59		69		79	
50	LDW-SC44-3-3.5	60		70		80	

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 #: 15238A36
SDG #: JL31, 32, 33 + 3V

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: GC ___ HPLC

Are surrogates required by the method? Yes____ or No____.
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

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

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	22	not specified	DCB	DO (50-150)	no quan. 10X DIL
			TCMX	49.5 (↓)	↓
				( )	
	22	↓	PCB	DO (↓)	↓ 10X
				( )	
	23	↓	↓	DO (↓)	↓ 10X
				( )	
	28	↓	↓	DO (↓)	↓ 100X
				( )	
	29	↓	↓	DO (↓)	↓ 100X
				( )	
	30	↓	↓	↓ (↓)	↓ 50X
				( )	
	31	↓	↓	↓ (↓)	↓ 50X
				( )	
	32	↓	↓	172 (↓)	↓ 20X
				( )	
	3349	↓	~~TCMX~~	~~HO~~ 49.5 (↓)	↓ 10X
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 15238A36
SDG #: JL31, JL32, JL33 + JL34

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: ___GC ___HPLC

Are surrogates required by the method? Yes____ or No____.

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

Y N N/A Were surrogates spiked into all samples and blanks?

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

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	4	not specified	DCB	DO (50-150)	no surr 100X Pi
	6	↓	TCMX	44.6 (50-150)	↓ 2X DIL
	7	↓	↓	42.8 (50-150)	↓ 2X
	9	↓	↓	47.0 (50-150)	↓ 2X
	11	↓	↓	161 (50-150)	↓ 20X
	14	↓	DCB	173 (50-150)	↓ 10X
	15	↓	↓	169 (↓)	↓ 25X
	16	↓	DCB	DO (↓)	↓ 100X
			TCMX	DO (↓)	↓
	19	↓	DCB	DO (↓)	↓ 75X
	21	↓	↓	170 (↓)	↓ 20X

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 15238A36
SDG #: ~~JJ~~ JL31, 32, 33 + 34

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

METHOD: ~~GC~~ 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
	51+52	V	180 (50-150)	217 (50-150)	( )	18	no QUAL 5X dil
		BB	0 (50-150)	0 (50-150)	( )	↓	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	53+54	V	174 (50-150)	204 (50-150)	( )	20	no QUAL 2X dil
		BB	0 (↓)	0 (↓)	( )	↓	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 15238A36
SDG #: JL31/32/33/34

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	% RPD Bet. columns Finding ≤ 40	Associated Samples	Qualifications
	Aroclor 1260	46	17	J/~~A~~/A dit
	↓	42	40	J/A dit
	↓	46	45	J/A dit
	The choice of Aroclors reported were based on choice of "best fit" for peaks that could be due to other weathered Aroclors or might be more complex mixture			Text

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15115A19 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/31/06
SDG #: JH57 Level IV Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Butyltins (Krone/(EPA SW 846 Method 8270D-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: 2/17/06 – 2/25/06.
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples (Lcs)	A	LCS
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	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 sediments

1	LDW-SC26-6-8**	11		21		31	
2	LDW-SC26-6-8DL**	12		22		32	
3	LDW-SC28-5.5-7.5	13		23		33	
4	LDW-SC28-5.5-7.5DL	14		24		34	
5	LDW-SC15-4-6	15		25		35	
6	LDW-SC23-4-6	16		26		36	
7	LDW-SC25-4-6	17		27		37	
8	LDW-SC25-4-6DL	18		28		38	
9	LDW-SC28-5.5-7.5MS	19		29		39	
10	LDW-SC28-5.5-7.5MSD	20		30		40	

LDC #: 15115A19
SDG #: J457

VALIDATION FINDINGS CHECKLIST

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

Butylfin Frone GCMS/SIM

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?		✓	•	
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 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) ≤ 25% and relative response factors (RRF) ≥ 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?	✓			
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?	✓			

LDC #: 15115A19
SDG #: JH57

VALIDATION FINDINGS CHECKLIST

Reviewer: B
2nd Reviewer: C

Validation Area	Yes	No	NA	Findings/Comments
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/CRQL				
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.	✓			
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 #: 15115A19
SDG #: JH57

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: 5
2nd Reviewer: 1

METHOD: ~~GC~~ ~~HPLC~~ GC MS/SIM Butyltin krone

Are surrogates required by the method? Yes____ or No____.

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

Y N N/A Were surrogates spiked into all samples and blanks?

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

#	Sample ID	~~Detector~~ Column	Surrogate Compound	%R (Limits)	Qualifications
	2		Tripropyl Tin chloride	DO (20 - 130)	no QUAL .40x DIL
			Tripentyl Tin chloride	DO (↓)	↓
				( )	
	3		↓	↓ (↓)	↓ 20x DIL
				(↓)	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Tripentyltin
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate

LDC #: 15115A19
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

METHOD: ~~GC~~ ~~HPLC~~ GCMS/SIM Butyltin Krone

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
	9+10	Tributyl Tin Ion	0 (20-130)	0 (20-130)	( )	3	no qual 2x DL
		Dibutyl Tin Ion	0 (↓)	0 (↓)	( )	↓	↓
		Butyl Tin Ion	0 (↓)	0 (↓)	( )	↓	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 15115A19
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

Butyl tin krone GCMS/SIM

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~~ compound	Finding	Associated Samples	Qualifications
		Tributyl Tin Ion	exceeded cal Range	1, 7	NA
		Tributyl Tin Ion	↓	3	NA
		Dibutyl Tin Ion	↓	↓	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15115A19
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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

METHOD: ~~GC~~ HPLC GCMS/SIM Butyltin krone

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
	Tributyl Tin Ion	exceeded cal range	1, 7	R/A
	All except Above	diluted	2, 8	R/A
	Tributyl Tin Ion	exceeded cal range	3	R/A
	Dibutyl Tin Ion			
	All except Above	diluted	4	R/A

Comments: _____

OVRNew.wpd

LDC #: _____

SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: _____

2nd Reviewer: _____

METHOD: GC/MS ~~BNA (EPA SW 846 Method 8270)~~ SIM Butyltin (Krone)

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 std)	Recalculated RRF (1/2 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	NT1-ICAL	3/15/06	~~Phenol~~ Tributyl Tin (1st internal standard)	0.600	0.600	0.586	0.586	3.0	3.0
			~~Naphthalene~~ Di-butyl Tin (2nd internal standard)	0.043	0.043	0.042	0.042	6.1	6.1
			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)						
			Peritachlorophenol (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 #: 15115A19
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

SIM Butyl Tin Krone

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	CCV	5/10/06	~~Phenol~~ (1st Internal standard)	0.586	0.550	0.550	6.1	6.1
			Naphthalene (2nd internal standard)	0.042	0.045	0.045	7.1	7.1
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2	CCV	5/11/06	~~Phenol~~ (1st Internal standard)		0.582	0.582	0.7	0.7
			~~Naphthalene~~ (2nd internal standard)		0.042	0.042	0	0
			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 #: 15115A19
SDG #: J1457

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 13
2nd reviewer: M

SIM Butyl Tin Krone
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~~ tripropyl Tin	47.27	12.37	= 22.1 26.16 (8508)	23.25	0
~~2-Fluorobiphenyl~~ tri pentyl Tin	↓	15.34	32.45 (.4809)	28.58	0
Terphenyl-d14			= 28.5		
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 #: 15113A19
SDG #: 2H57

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 1
2nd Reviewer: 2

METHOD: GC/MS ~~BNA (EPA SW-846 Method 8270)~~ SOM Butyl Tin (Krone)

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 = | MS - MSD | * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 9+10

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
~~Tributyl Tin Phenol~~	44.4	44.1	3920	3300	3690	0	0	0	0	11.2	11.2
2-Chlorophenol											
1,4-Dichlorobenzene											
N-Nitroso-di-n-propylamine											
1,2,4-Trichlorobenzene											
4-Chloro-3-methylphenol											
Acenaphthene											
4-Nitrophenol											
2,4-Dinitrotoluene											
Pentachlorophenol											
Pyrene											

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

LDC #: 15115A19
SDG #: JH57

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

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

METHOD: GC/MS BNA ~~(EPA SW-846 Method 8270)~~ SIM Butyl Tin krone

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: ~~0603091A6~~ LCS

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
Tributyl Tin Phenol	44.6	NA	28.6	NA	64.1	64.1	NA			
2-Chlorophenol										
1,4-Dichlorobenzene										
N-Nitroso-di-n-propylamine										
1,2,4-Trichlorobenzene										
4-Chloro-3-methylphenol										
Acenaphthene										
4-Nitrophenol										
2,4-Dinitrotoluene										
Pentachlorophenol										
Pyrene										

Comments: Refer to 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 #: 15115A19 | **VALIDATION FINDINGS WORKSHEET** | Page: 1 of 1

SDG #: JH57 | **Sample Calculation Verification** | Reviewer: [illegible]

SIM Butyl Tin krone | 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 . Dibutyl tin

Conc. = $\frac{(169919)(0.2)(0.5)(2)(0.578)(1000)}{(169950)(0.042)(5.29)(\quad)(\quad)}$

= 520 ng/kg

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

LDC #: 15115A4

SDG #: JH57

Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level IV / III

Date: 6/21/06

Page: 1 of 1

Reviewer: MN

2nd Reviewer: dc

METHOD: Metals (EPA SW 846 Method 6010B/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: 2/9/06 - 2/25/06 ~~2/27/06~~
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	LCS, SDM
VIII.	Internal Standard (ICP-MS)	N	Not validated
IX.	Furnace Atomic Absorption QC	N	
X.	ICP Serial Dilution	N	Not performed
XI.	Sample Result Verification	A	
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 ** level IV

1	LDW-SC26-6-8 **	11	LDW-SC16-8-10 **	21		31	
2	LDW-SC26-11.1-12.1	12	LDW-SC14-4.1-6	22		32	
3	LDW-SC37-5.3-6.9 **	13	LDW-SC25-4-6	23		33	
4	LDW-SC28-5.5-7.5 **	14	LDW-SC2-4-6	24		34	
5	LDW-SC33-4-6	15	LDW-SC2-10.7-12	25		35	
6	LDW-SC12-4-6.7	16	LDW-SC17-6-8.2	26		36	
7	LDW-SC6-6-8	17	LDW-SC26-6-8MS	27		37	
8	LDW-SC8-4-6	18	LDW-SC26-6-8DUP	28		38	
9	LDW-SC10-4-5	19	PB	29		39	
10	LDW-SC16-4-6	20		30		40	

Notes:

LDC #: 51154

SDG #: JH59

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2

Reviewer: MH

2nd Reviewer: AL

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? (Level IV only)	✓			
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 anayized 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? (Level IV only)			✓	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	

LDC #: 15154C4
SDG #: JH57

VALIDATION FINDINGS CHECKLIST

Page: 2 of 4
Reviewer: LM
2nd Reviewer: DV

Validation Area	Yes	No	NA	Findings/Comments
VII. ICB 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 (ERA 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 #: 15115A4
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Reviewer: MH
2nd reviewer: [illegible]

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-5,7,8,10 -11,13-16	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', ___ ___
1,4,6,7-12,16	↓	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

LDC #: 15115A4
SDG #: JY457

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: MH
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: _____
Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: ~~All~~ 1-5, 7, 8, 10, 11, 13-16 (All > 10X)

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification										
Al															Al
Sb						No qual (> 10X)									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
Ni															Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn	1.1														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.

LDC #: 15115A4
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

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

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~~ 70-130? 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	17	Sediment	Sb	29.9	~~All~~ 1-16, 18	J/UJ/A (post spike 91.0)
			Cr	69.5	↓	No qual (round off to 70)
					1-5, 7, 8, 10, 11, 13-16, 18.	

Comments:

MS.4S2

LDC #: 15154
SDG #: JH59

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MJ
2nd Reviewer: [signature]

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 / True x 100 Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP (Initial calibration)	As	19.9	20.0	99.0	98.9	Y
	GFAA (Initial calibration)						
ICV	CVAA (Initial calibration)	Hg	8.20	8.0	102.5	102.5	Y
CCV	ICP (Continuing calibration)	Zn	10.25	10.00	102.5	102.5	Y
	GFAA (Continuing calibration)						
CCV	CVAA (Continuing calibration)	Hg	3.70	4.0	92.5	92.5	Y
	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 #: 15115A4
SDG #: JH57

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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:

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

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

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

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

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Se	1002	1000	100.2	100.2	Y
LCS	Laboratory control sample	Tl	203.4	200	102	102	|
17	Matrix spike	V	(SSR-SR) 99.0	83.4	94.7	94.7	|
18	Duplicate	Sb	27.2	28.2	3.5	3.6	|
MR	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.

LDC #: 15115A4
SDG #: JH47

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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, 11 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:

#11 As = $\frac{0.0948\ mg/L \times 0.1\ L \times 1000\ g/kg}{1.053\ g \times 0.671}$

= 14.26 mg/kg

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
1	Sb	270	270	Y
	As	1740	1740	
	Cd	3	3	
	Cr	163	163	
	Co	103	103	
	Cu	1950	1950	
	Pb	1350	1350	
	Hg	4.03	4.03	
	Mo	153	153	
	Ni	60	60	
	Ag	3	3	
	V	69	69	
	Zn	3800	3800	
11	As	14	14	
	Cd	1.2	1.2	
	Cr	34.9	35.0	
	Co	7.3	7.3	
	Cu	53.9	53.9	
	Pb	79	79	
	Hg	0.35	0.35	
	Mo	1.3	1.3	✓

LDC #: 51154

SDG #: 0H57

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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 11 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(DI)}{(In.\ Vol.)(\%S)}$

Recalculation:

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
DI = Dilution factor
%S = Decimal percent solids

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
11	Ni	20	20	Y
	Ag	0.5	0.5	↓
	V	63.9	63.9	↓
	Zn	137	134	

RECALC.4S2

LDC #: 15238A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/24/06
SDG #: JL31/~~JL32/JL33/JL34~~ MM Level III Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: MM
2nd Reviewer: M

METHOD: Lead & Mercury (EPA SW 846 Method 6010B/7471A)

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: 2/9/06 - 2/11/06
II.	Calibration	SW	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	3 MS/MSD
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	LCS, SRM
VIII.	Internal Standard (ICP-MS)	N	Not utilized
IX.	Furnace Atomic Absorption QC	N	
X.	ICP Serial Dilution	N	Not performed
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-SC1-0-.5	11	LDW-SC1-0-.5MS	21		31	
2	LDW-SC1-.5-1	12	LDW-SC1-0-.5DUP	22		32	
3	LDW-SC1-1-1.5	13	LDW-SC33-0-0.5MS	23		33	
4	LDW-SC1-1.5-2	14	LDW-SC33-0-0.5DUP	24		34	
5	LDW-SC33-0-0.5	15	PB	25		35	
6	LDW-SC33-0.5-1	16		26		36	
7	LDW-SC33-1-1.5	17		27		37	
8	LDW-SC33-1.5-2	18		28		38	
9	LDW-SC33-2-2.5	19		29		39	
10	LDW-SC33-2.5-3	20		30		40	

Notes:

LDC #: 18038A4
SDG #: JL31

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-4	Sedmt	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, **(Hg)**, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
5-10	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, **(Pb)**, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
or 11, 12	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, **(Hg)**, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
✓ 13, 14	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, **(Pb)**, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, 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 #: 15238A4
SDG #: JL31

VALIDATION FINDINGS WORKSHEET
Calibration

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

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	6/14/06	CRDL	Hg	140 (70-130)	1-4	No qual (All > 2x CRDL)

Comments:

CAL4SW

LDC #: 15063A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/8/06
SDG #: JK31 Level III/IV Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: MM
2nd Reviewer: 4

METHOD: Total Organic Carbon (Plumb), Total Solids (EPA 160.3)

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: 2/6/06 – 2/25/06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A ~~SW~~	
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	A	LCS, SRM
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(8.9), ~~DK~~
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: See sheets

1	LDW-SC26-6-8	**	11	LDW-SC45-5-6	**	21	LDW-SC16-8-10	31	LDW-SC19-4-6
2	LDW-SC26-11.1-12.1		12	LDW-SC15-4-6		22	LDW-SC23-4-6	32	LDW-SC46-4-6.8
3	LDW-SC51-3.8-5.8		13	LDW-SC20-4-6		23	LDW-SC21-4-6.2	33	LDW-SC49-4-6
4	LDW-SC37-5.3-6.9		14	LDW-SC39-4-6		24	LDW-SC32~~6~~5.2-8	34	LDW-SC26-6-8MS
5	LDW-SC28-5.5-7.5		15	LDW-SC12-4-6.7		25	LDW-SC14-4.1-6	35	LDW-SC26-6-8DUP
6	LDW-SC1-4-6		16	LDW-SC6-6-8		26	LDW-SC203-4-6	36	LDW-SC16-8-10MS
7	LDW-SC4-4-6		17	LDW-SC8-4-6		27	LDW-SC25-4-6	37	LDW-SC16-8-10DUP
8	LDW-SC33-4-6		18	LDW-SC8-6-8		28	LDW-SC2-4-6	38	LDW-SC26-6-8 TRP
9	LDW-SC201-4-6		19	LDW-SC10-4-5	J	29	LDW-SC2-10.7-12	39	LDW-SC16-8-10 TRP
10	LDW-SC41-4-6	J	20	LDW-SC16-4-6		30	LDW-SC17-6-8.2	40	MB

Notes:

LDC #: 15063A6
SDG #: JK31

VALIDATION FINDINGS CHECKLIST

Reviewer: MH
2nd Reviewer: [illegible]

Method: Inorganics (EPA Method See cmt)

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? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)				
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 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 #: 15163A6
SDG #: JK31

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer: M

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 #: 15063A6
SDG #: JK3

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Parameter
1-33	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (TS)
34,36	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+}
35,37-39	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (TS)
	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#: 15063A6
SDG#: JK31

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: MM
2nd Reviewer: M

Inorganics, Method See cover

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

Analyte	Concentration (%)		RPD	
	8	9		
Total Solids	60.40	57.10	6	(≤20)
TOC	2.10	2.13	1	(≤30)

LDC #: 15063A6
SDG #: JK31

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MY
2nd Reviewer:

METHOD: Inorganics, Method See cover

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 = Found x 100 / True

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					
		Standard 5					
		Standard 6					
		Standard 7					
Calibration verification CCV	TDC	50.00	4.984		99.68	99.86	Y
Calibration verification CCV	↓	50.00	4.942		98.84	98.84	↓
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.

LDC #: 15063A6
SDG #: JK31

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MM
2nd Reviewer:

METHOD: Inorganics, Method See cover

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

%R = Found / True x 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 = |S-D| / (S+D)/2 x 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	0.508	0.5	101.6	101.6	Y
34	Matrix spike sample	↓	(SSR-SR) 1.92	1.91	100.5	100.5	↓
1.35,38	Duplicate sample	TS	62.9	61.8 62.5	0.9	0.9	↓

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 #: 1563A6
SDG #: 1563

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: Inorganics, Method See cover

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 1, 11 reported with a positive detect were recalculated and verified using the following equation:

Concentration =

$$TOC = \frac{TOC \times TS\ (TOC)}{TS\ (Sample)}$$

Recalculation:

#1 $$TOC = \frac{17798\ mg/kg \times 64.96}{61.8} = 18731\ mg/kg = 1.87319\%$$

#	Sample ID	Analyte	Reported Concentration (%)	Calculated Concentration (%)	Acceptable (Y/N)
1	1	TS	61.8	61.8	Y
		TOC	1.87	1.87	↓
2	11	TS	80.0	80.0	Y
		TOC	0.272	0.272	↓

Note:

LDC #: 15238A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/24/06
SDG #: JL31/JL32/JL33/JL34 Level III Page: 1 of 7
Laboratory: Analytical Resources, Inc. Reviewer: LWS
2nd Reviewer: [illegible]

METHOD: Total Solids (EPA Method 160.3), TOC (Plumb)

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: 2/9/06 - 2/22/06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	MS + Triplicate.
V	Duplicates	A	Triplicates
VI.	Laboratory control samples	A	LCS, SRM
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-SC1-0-.5	11	LDW-SC6-3-3.5	21	LDW-SC13-.5-1	31	LDW-SC27-2-2.5
2	LDW-SC1-.5-1	12	LDW-SC6-3.5-4	22	LDW-SC13-1-1.5	32	LDW-SC27-2.5-3
3	LDW-SC1-1-1.5	13	LDW-SC6-4-4.5	23	LDW-SC13-1.5-2	33	LDW-SC27-3-3.5
4	LDW-SC1-1.5-2	14	LDW-SC33-0-0.5	24	LDW-SC13-2-2.5	34	LDW-SC27-3.5-4
5	LDW-SC6-0-0.5	15	LDW-SC33-0.5-1	25	LDW-SC13-2.5-3	35	LDW-SC27-4-4.5
6	LDW-SC6-0.5-1	16	LDW-SC33-1-1.5	26	LDW-SC13-3-3.5	36	LDW-SC12-0-.5
7	LDW-SC6-1-1.5	17	LDW-SC33-1.5-2	27	LDW-SC27-0-0.5	37	LDW-SC12-.5-1
8	LDW-SC6-1.5-2	18	LDW-SC33-2-2.5	28	LDW-SC27-0.5-1	38	LDW-SC12-1-1.5
9	LDW-SC6-2-2.5	19	LDW-SC33-2.5-3	29	LDW-SC27-1-1.5	39	LDW-SC12-1.5-2
10	LDW-SC6-2.5-3	20	LDW-SC13-0-.5	30	LDW-SC27-1.5-2	40	LDW-SC12-2-2.5

Notes:

LDC #: 15238A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/24/06
SDG #: JL31/JL32/JL33/JL34 Level III Page: 2 of 2
Laboratory: Analytical Resources, Inc. Reviewer: MH
2nd Reviewer: [illegible]

METHOD: Total Solids (EPA Method 160.3), TOC (Plumb)

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		Sampling dates:
IIa.	Initial calibration		
IIb.	Calibration verification		
III.	Blanks		
IV	Matrix Spike/Matrix Spike Duplicates		
V	Duplicates		See page 1
VI.	Laboratory control samples		
VII.	Sample result verification	N	
VIII.	Overall assessment of data		
IX.	Field duplicates		
X	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:

41	LDW-SC12-2.5-3	51	LDW-SC23-3.5-4	61	LDW-SC51-1-1.5	71	LDW-SC1-1-1.5 TRP
42	LDW-SC12-3-3.5	52	LDW-SC44-0-.5	62	LDW-SC51-1.5-2	72	LDW-SC13-.5-1 TRP
43	LDW-SC12-3.5-4	53	LDW-SC44-.5-1	63	LDW-SC1-1-1.5MS	73	LDW-SC12-0-.5 TRP
44	LDW-SC23-0-0.5	54	LDW-SC44-1-1.5	64	LDW-SC1-1-1.5DUP	74	LDW-SC44-0-.5 TRP
45	LDW-SC23-0.5-1	55	LDW-SC44-1.5-2	65	LDW-SC13-.5-1MS	75	MB
46	LDW-SC23-1-1.5	56	LDW-SC44-2-2.5	66	LDW-SC13-.5-1DUP	76	
47	LDW-SC23-1.5-2	57	LDW-SC44-2.5-3	67	LDW-SC12-0-.5MS	77	
48	LDW-SC23-2-2.5	58	LDW-SC44-3-3.5	68	LDW-SC12-0-.5DUP	78	
49	LDW-SC23-2.5-3	59	LDW-SC51-0-0.5	69	LDW-SC44-0-.5MS	79	
50	LDW-SC23-3-3.5	60	LDW-SC51-0.5-1	70	LDW-SC44-0-.5DUP	80	

Notes:

LDC #: 15238A6
SDG #: See cover

VALIDATION FINDINGS WORKSHEET

Sample Specific Analysis Reference

Reviewer: MM
2nd reviewer: A

All circled methods are applicable to each sample.

Sample ID	Parameter
1-62	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} TS ____ ____ ____
64,71,66,72,68,73,70,74	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} TS ____ ____ ____
63,65,67,69	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 #: 15145A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 6/22/06
SDG #: DPWG19451/WG19107 Level IV Page: 1 of 1
Laboratory: AXYS Analytical Services Ltd. Reviewer: 9
2nd Reviewer: M

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

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: 7/15 - 22/06
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	%RSD ≤ 20/30 (Native/Labelled)
IV.	Routine calibration	A	QC limits
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates/Dup	N/A	
VII.	Laboratory control samples	A	LCS. CRM.
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	A	
XI.	Compound quantitation and CRQLs	A	
XII.	System performance	A	
XIII.	Overall assessment of data	A 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-SC26-6-8 ** sed	11	WG19107-101	21		31	
2	LDW-SC20-4-6 ** "	12		22		32	
3	LDW-SC20-4-6 Dup	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 #: 16145A21
SDG #: DPW91957

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: AC

Method: Dioxins/Dibenzofurans (EPA ~~SW 846~~ Method ~~8290~~) 1613

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				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
III. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled standards and ≤ 30% for labeled standards?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
IV. Continuing calibration				
Was a routine calibration performed at the beginning and end of each 12 hour period?	✓			
Were all ~~percent differences (%D) ≤ 20%~~ conc meet QC limits for unlabeled standards and ~~≤ 30% for~~ labeled standards?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?	✓			
VI. 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
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 15145A21
SDG #: OPW61945

VALIDATION FINDINGS CHECKLIST

Reviewer: AK
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
IX. Internal standards				
Were internal standard recoveries within the 40-135% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
X. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓		✓	
XI. 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?	✓			
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.	✓	✓		

LDC #: 15145A21
SDG #: DDW6194S1

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: M

Validation Area	Yes	No	NA	Findings/Comments
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: HRGC/HRMS Dioxins/Dibenzofurans (EPA ~~SW-846~~ Method ~~8290~~) 1613

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes: _____

LDC #: 15145A21
SDG #: OPNS1945/

VALIDATION FINDINGS WORKSHEET
Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method ~~8290~~) 1613B)

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 analyzed for each matrix?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 5/19/06 **Blank analysis date:** 5/21/06
Conc. units: ng/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
NS	9107-101	All								
F	0.070	75X								
G	0.118									
H	0.076									
U	0.070									

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:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 15445A21
SDG #: OPNG1945

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer: 9
2nd Reviewer: K

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA ~~SW 846~~ Method ~~8290~~ 1613B)

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
		All	H on DB-5	All	P/A

Comments: _____

LDC #: 15145A21
SDG #: DPWG19451

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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 Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported RRF (CS3 std)	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	5/16/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.22	1.22	1.17	1.17	7.35	7.36
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.01	1.01	1.01	1.01	4.01	4.12
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.91	0.91	0.89	0.89	6.59	6.49
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.07	1.07	1.02	1.02	9.41	9.35
			OCDF (^{13}C-OCDD)	1.55	1.55	1.42	1.42	9.23	9.20
2	ICAL	4/27/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.99	0.99	0.97	0.97	11.9	11.7
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

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 #: 15145A21
SDG #: DPWG19451

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

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

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA ~~SW 846~~ Method ~~8290~~) 1613B

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~~ Amt (CC)	Recalculated ~~RRF~~ Amt (CC)	Reported %D	Recalculated %D
1	DX62-2305-4	5/21/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.22	10.9	10.9		
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.01	11.8	11.8		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.91	55.5	55.6		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.07	51.0	51.0		
			OCDF (^{13}C-OCDD)	1.55	106	106		
2	DX63-147DS S-2	5/20/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.99	9.17	9.11		
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
3	DX62-253 S-1	6/6/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.22	10.4	10.4		
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.01	11.1	11.1		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.91	52.7	52.5		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.07	50.5	50.4		
			OCDF (^{13}C-OCDD)	1.55	107	107		

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

LDC #: 15145A21
SDG #: DPWG1945/

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: 9
2nd Reviewer: dc

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA ~~SW 846~~ Method ~~8290~~ 1613B)

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 ~~Amt~~ (CC)	Recalculated ~~RRF Amt~~ (CC)	Reported %D	Recalculated %D
1	0X62_23151	5/22/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.22	10.6	10.6		
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.01	11.4	11.5		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.91	51.4	51.5		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.07	48.6	48.6		
			OCDF (^{13}C-OCDD)	1.55	107	107		
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

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

LDC #: 61454-21
SDG #: DWG1945

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: 9
2nd Reviewer: A

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA ~~SW 846~~ Method ~~8290~~ 1613B)

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

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

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

LCS ID: WG19107-102

Compound	Spike Added (ng/ml)		Spiked Sample Concentration (ng/ml)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
2,3,7,8-TCDD	10	NA	11.1	NA	111	111				
1,2,3,7,8-PeCDD	50		53.0		106	106				
1,2,3,4,7,8-HxCDD	↓		53.2		106	106				
1,2,3,6,7,8-HxCDD										
1,2,3,7,8,9-HxCDD										
1,2,3,4,6,7,8-HpCDD										
OCDD										
2,3,7,8-TCDF										
1,2,3,7,8-PeCDF										
2,3,4,7,8-PeCDF										
1,2,3,4,7,8-HxCDF										
1,2,3,6,7,8-HxCDF										
2,3,4,6,7,8-HxCDF										
1,2,3,7,8,9-HxCDF										
1,2,3,4,6,7,8-HpCDF										
1,2,3,4,7,8,9-HpCDF	50		50.5		101	101				
OCDF	100		105		105	105				

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

Ions Monitored for HRGC/HRMS Analysis of PCDDs/PCDFs

Descriptor	Accurate mass[a]	Ion ID	Elemental Composition	Analyte	Descriptor	Accurate Mass[a]	Ion ID	Elemental Composition	Analyte
1	303.9016	M	$C_{12}H_4{}^{35}Cl_4O$	TCDF	4	407.7818	M+2	$C_{12}H^{35}Cl_6{}^{37}ClO$	HpCDF
	305.8987	M+2	$C_{12}H_4{}^{35}Cl_3{}^{37}C10$	TCDF		409.7788	M+4	$C_{12}H^{35}Cl_5{}^{37}Cl_2O$	HpCDF
	315.9419	M	$^{13}C_{12}H_4{}^{35}Cl_4O$	TCDF (S)		417.8250	M	$^{13}C_{12}H^{35}Cl_7O$	HpCDF (S)
	317.9389	M+2	$^{13}C_{12}H_4{}^{35}Cl_3{}^{37}ClO$	TCDF (S)		419.8220	M+2	$^{13}C_{12}H^{35}Cl_6{}^{37}ClO$	HpCDF
	319.8965	M	$C_{12}H_4{}^{35}Cl_4O_2$	TCDD		423.7767	M+2	$C_{12}H^{35}Cl_6{}^{37}ClO_2$	HpCDD
	321.8936	M+2	$C_{12}H_4{}^{35}Cl_3{}^{37}C10_2$	TCDD		425.7737	M+4	$C_{12}H^{35}Cl_5{}^{37}Cl_2O_2$	HpCDD
	331.9368	M	$^{13}C_{12}H_4{}^{35}Cl_4O_2$	TCDD (S)		435.8169	M+2	$^{13}C_{12}H^{35}Cl_6{}^{37}ClO_2$	HpCDD (S)
	333.9338	M+2	$^{13}C_{12}H_4{}^{35}Cl_3{}^{37}ClO_2$	TCDD (S)		437.8140	M+4	$^{13}C_{12}H^{35}Cl_5{}^{37}Cl_2O_2$	HpCDD (S)
	375.8364	M+2	$C_{12}H_4{}^{35}Cl_5{}^{37}ClO$	HxCDPE		479.7165	M+4	$C_{12}H^{35}Cl_7{}^{37}Cl_2O$	NCDPE
	[354.9792]	LOCK	C_9F_{13}	PFK		[430.9728]	LOCK	C_9F_{17}	PFK
2	339.8597	M+2	$C_{12}H_3{}^{35}Cl_4{}^{37}ClO$	PeCDF	5	441.7428	M+2	$C_{12}{}^{35}Cl_7{}^{37}ClO$	OCDF
	341.8567	M+4	$C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O$	PeCDF		443.7399	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O$	OCDF
	351.9000	M+2	$^{13}C_{12}H_3{}^{35}Cl_4{}^{37}C10$	PeCDF (S)		457.7377	M+2	$C_{12}{}^{35}Cl_7{}^{37}ClO_2$	OCDD
	353.8970	M+4	$^{13}C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O$	PeCDF (S)		459.7348	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O_2$	OCDD
	355.8546	M+2	$C_{12}H_3{}^{35}Cl_4{}^{37}ClO_2$	PeCDD		469.7780	M+2	$^{13}C_{12}{}^{35}Cl_7{}^{37}ClO_2$	OCDD (S)
	357.8516	M+4	$C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O_2$	PeCDD		471.7750	M+4	$^{13}C_{12}{}^{35}Cl_6{}^{37}Cl_2O_2$	OCDD (S)
	367.8949	M+2	$^{13}C_{12}H_3{}^{35}Cl_4{}^{37}ClO_2$	PeCDD (S)		513.6775	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O$	DCDPE
	369.8919	M+4	$^{13}C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O_2$	PeCDD (S)		[422.9278]	LOCK	$C_{10}F_{17}$	PFK
	409.7974	M+2	$C_{12}H_3{}^{35}Cl_6{}^{37}ClO$	HpCDPE					
	[354.9792]	LOCK	C_9F_{13}	PFK					
3	373.8208	M+2	$C_{12}H_2{}^{35}Cl_5{}^{37}ClO$	HxCDF					
	375.8178	M+4	$C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O$	HxCDF					
	383.8639	M	$^{13}C_{12}H_2{}^{35}Cl_6O$	HxCDF (S)					
	385.8610	M+2	$^{13}C_{12}H_2{}^{35}Cl_5{}^{37}ClO$	HxCDF (S)					
	389.8156	M+2	$C_{12}H_2{}^{35}Cl_5{}^{37}ClO_2$	HxCDD					
	391.8127	M+4	$C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O_2$	HxCDD					
	401.8559	M+2	$^{13}C_{12}H_2{}^{35}Cl_5{}^{37}ClO_2$	HxCDD (S)					
	403.8529	M+4	$^{13}C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O_2$	HxCDD (S)					
	445.7555	M+4	$C_{12}H_2{}^{35}Cl_6{}^{37}Cl_2O$	OCDPE					
	[430.9728]	LOCK	C_9F_{17}	PFK					

(a) The following nuclidic masses were used:

H = 1.007825	O = 15.994915
C = 12.000000	^{35}Cl = 34.968853
^{13}C = 13.003355	^{37}Cl = 36.965903
F = 18.9984	

S = Internal/recovery standard

LDC #: 15145A21
SDG #: OPNG1915

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA ~~SW 846~~ Method ~~8290~~ 1613B)

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

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).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

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

Example:

Sample I.D. 1 , A :

Conc. = $\frac{(1.14e+06)(2000)(\quad 1 \quad)}{(6.47e+06)(1.01)(10.4)(\quad)}$

= 3.36 ng/Fg

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