APPENDIX D 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 #15720/15767/15896
December 26, 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 data validation of analytical chemistry results generated in support of the Lower Duwamish Waterway Group project. The analyses were performed by Analytical Resources, Inc. 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 200.8/7471A, Total Organic Carbon by Plumb Method, Grain Size by PSEP 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 : JZ15, JZ53, KA18, and DPWG20754/WG20336. 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

Attachment 1

LDC #15720 (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 (200.8/ (7471A)		TOC (Plumb)		Total Solids (160.3)		Grain Size (PSEP)																			
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	JZ15	11/02/06	11/27/06	0	11	0	11	0	11	0	11	0	11	0	11	0	11																
Total	B/SC			0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77

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

Attachment 1

LDC #15767 (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 (200.8/ (7471A)		Butyl -tins (Krone)		TOC (Plumb)		Total Solids (160.3)		Grain Size (PSEP)																	
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	JZ53	11/10/06	12/05/06	0	19	0	19	0	19	0	19	0	4	0	19	0	19	0	19														
B	KA18	11/10/06	12/05/06	0	17	0	17	0	17	0	17	-	-	0	17	0	17	0	17														
Total	B/SC			0	36	0	36	0	36	0	36	0	4	0	36	0	36	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	256

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

Attachment 1

LDC #15896 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Dioxins (1613)																															
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	DPWG20754/WG20336	12/01/06	12/22/06	0	5																														
Total	B/SC			0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5

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

CHEMICAL DATA QUALITY REVIEW FOR SUBSURFACE SEDIMENT SAMPLES (ROUND 3)

Lower Duwamish Waterway Group
LDC#s 15720, 15767, 15896

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. 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 200.8/7471A, Total Organic Carbon by Plumb Method, Grain Size by PSEP 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 : JZ15, JZ53, KA18, and DPWG20754/WG20336. See the Sample Analysis Table (Attachment 1) for the number of samples reviewed and the Sample Validation Table (Attachment 2) for the sample identifications and analyses. Sample IDs ending in "**" underwent Level IV review.

The QC guidelines used for data qualification are those specified in the National Functional Guidelines for Organic Data Review (October 1999) and the National Functional Guidelines for Inorganic Data Review (July 2002). Specific QC criteria used follow the Final Surface Sediment Sampling for Chemical Analyses in the Lower Duwamish Waterway Round 3 Addendum Quality Assurance Project Plan (September 26, 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 #15720 (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 (200.8/ (7471A)		TOC (Plumb)		Total Solids (160.3)		Grain Size (PSEP)																	
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	JZ15	11/02/06	11/27/06	0	11	0	11	0	11	0	11	0	11	0	11	0	11																
Total	B/SC			0	11	0	11	0	11	0	11	0	11	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77

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

Attachment 2

SDG#: JZ15 — VALIDATION SAMPLE TABLE — **LDC#:** 15720A

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)	TOC (Plumb)	Total Solids (160.3)	Grain Size (PSEP)					
LDW-SS330-010	JZ15A	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS327-010	JZ15B	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS328-010	JZ15C	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS329-010	JZ15D	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS401-010	JZ15E	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS331-010	JZ15F	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS332-010	JZ15G	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS334-010	JZ15H	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS333-010	JZ15I	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS337-010	JZ15J	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS402-010	JZ15K	sediment	10/02/06	X	X	X	X	X	X	X					
LDW-SS330-010MS	JZ15AMS	sediment	10/02/06				X	X							
LDW-SS330-010DUP	JZ15ADUP	sediment	10/02/06				X	X	X						
LDW-SS330-010TRP	JZ15ATRP	sediment	10/02/06						X						
LDW-SS331-010MS	JZ15FMS	sediment	10/02/06			X									
LDW-SS331-010MSD	JZ15FMSD	sediment	10/02/06			X									
LDW-SS337-010MS	JZ15JMS	sediment	10/02/06	X	X										
LDW-SS337-010MSD	JZ15JMSD	sediment	10/02/06	X	X										
LDW-SS337-010DUP	JZ15JDUP	sediment	10/02/06							X					
LDW-SS337-010TRP	JZ15JTRP	sediment	10/02/06							X					

Note: X = Validation was performed.

Attachment 1

LDC #15767 (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 (200.8/ (7471A)		Butyl -tins (Krone)		TOC (Plumb)		Total Solids (160.3)		Grain Size (PSEP)																	
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	JZ53	11/10/06	12/05/06	0	19	0	19	0	19	0	19	0	4	0	19	0	19	0	19																
B	KA18	11/10/06	12/05/06	0	17	0	17	0	17	0	17	-	-	0	17	0	17	0	17																
Total	B/SC			0	36	0	36	0	36	0	36	0	4	0	36	0	36	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	256

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

Attachment 2

SDG#: JZ53 — VALIDATION SAMPLE TABLE — **LDC#:** 15767A

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)	Butyl-tins (Krone)	TOC (Plumb)	Total Solids (160.3)	Grain Size (PSEP)				
LDW-SS344-RB	JZ53A	water	10/03/06	X	X	X	X	X	X						
LDW-SS344-010	JZ53B	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS342-010	JZ53C	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS343-010	JZ53D	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS341-010	JZ53E	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS339-010	JZ53F	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS340-010	JZ53G	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS338-010	JZ53H	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS336-010	JZ53I	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS301-010	JZ53J	sediment	10/03/06	X	X	X	X	X	X	X	X				
LDW-SS302-010	JZ53K	sediment	10/03/06	X	X	X	X	X	X	X	X				
LDW-SS305-010	JZ53L	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS307-010	JZ53M	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS306-010	JZ53N	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS308-010	JZ53O	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS308-RB	JZ53P	water	10/03/06	X	X	X	X	X	X						
LDW-SS309-010	JZ53Q	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS310-010	JZ53R	sediment	10/03/06	X	X	X	X	X	X	X	X				
LDW-SS311-010	JZ53S	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS312-010	JZ53T	sediment	10/03/06	X	X	X	X		X	X	X				
LDW-SS312-010DL	JZ53TDL	sediment	10/03/06	X		X									
LDW-SS403-010	JZ53U	sediment	10/03/06	X	X	X	X	X	X	X	X				
LDW-SS344-010MS	JZ53BMS	sediment	10/03/06				X								
LDW-SS344-010DUP	JZ53BDUP	sediment	10/03/06				X								
LDW-SS306-010MS	JZ53NMS	sediment	10/03/06	X	X										

Note: X = Validation was performed.

SDG#: JZ53 | VALIDATION SAMPLE TABLE | **LDC#:** 15767A

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)	Butyl-tins (Krone)	TOC (Plumb)	Total Solids (160.3)	Grain Size (PSEP)				
LDW-SS306-010MSD	JZ53NMSD	sediment	10/03/06	X	X										
LDW-SS306-010DUP	JZ53NDUP	sediment	10/03/06								X				
LDW-SS306-010TRP	JZ53NTRP	sediment	10/03/06								X				
LDW-SS308-010MS	JZ53OMS	sediment	10/03/06			X			X						
LDW-SS308-010MSD	JZ53OMSD	sediment	10/03/06			X									
LDW-SS308-010DUP	JZ53ODUP	sediment	10/03/06						X	X					
LDW-SS308-010TRP	JZ53OTRP	sediment	10/03/06						X	X					
LDW-SS403-010MS	JZ53UMS	sediment	10/03/06					X							
LDW-SS403-010MSD	JZ53UMSD	sediment	10/03/06					X							

Note: X = Validation was performed.

Attachment 2

SDG#: KA18 — VALIDATION SAMPLE TABLE — **LDC#:** 15767B

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)	Butyl-tins (Krone)	TOC (Plumb)	Total Solids (160.3)	Grain Size (PSEP)				
LDW-SS335-010	KA18A	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS335-010DL	KA18ADL	sediment	10/04/06			X									
LDW-SS313-010	KA18B	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS314-010	KA18C	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS322-010	KA18D	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS323-010	KA18E	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS320-010	KA18F	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS319-010	KA18G	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS324-010	KA18H	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS321-010	KA18I	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS318-010	KA18J	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS317-010	KA18K	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS317-010DL	KA18KDL	sediment	10/04/06			X									
LDW-SS316-010	KA18L	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS316-010DL	KA18LDL	sediment	10/04/06	X		X									
LDW-SS315-010	KA18M	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS315-010DL	KA18MDL	sediment	10/04/06			X									
LDW-SS303-010	KA18N	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS303-010DL	KA18NDL	sediment	10/04/06			X									
LDW-SS325-RB	KA18O	water	10/04/06	X	X	X	X								
LDW-SS325-010	KA18P	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS325-010DL	KA18PDL	sediment	10/04/06			X									
LDW-SS326-010	KA18Q	sediment	10/04/06	X	X	X	X		X	X	X				
LDW-SS326-010DL	KA18QDL	sediment	10/04/06			X									
LDW-SS304-010	KA18R	sediment	10/04/06	X	X	X	X		X	X	X				

Note: X = Validation was performed.

SDG#: KA18 VALIDATION SAMPLE TABLE **LDC#:** 15767B

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)	Butyl-tins (Krone)	TOC (Plumb)	Total Solids (160.3)	Grain Size (PSEP)				
LDW-SS304-010DL	KA18RDL	sediment	10/04/06			X									
LDW-SS335-010MS	KA18AMS	sediment	10/04/06				X		X						
LDW-SS335-010DUP	KA18ADUP	sediment	10/04/06				X		X	X					
LDW-SS335-010TRP	KA18ATRP	sediment	10/04/06						X	X					
LDW-SS316-010MS	KA18LMS	sediment	10/04/06	X	X										
LDW-SS316-010MSD	KA18LMSD	sediment	10/04/06	X	X										
LDW-SS316-010DUP	KA18LDUP	sediment	10/04/06								X				
LDW-SS316-010TRP	KA18LTRP	sediment	10/04/06								X				
LDW-SS304-010MS	KA18RMS	sediment	10/04/06			X									
LDW-SS304-010MSD	KA18RMSD	sediment	10/04/06			X									

Note: X = Validation was performed.

Attachment 1

LDC #15896 (Windward Environmental, LLC - Seattle WA / Lower Duwamish Waterway Group)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Dioxins (1613)																															
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	DPWG20754/WG20336	12/01/06	12/22/06	0	5																														
Total	B/SC			0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5

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

Attachment 2

SDG#: DPWG20754/WG20336 VALIDATION SAMPLE TABLE **LDC#:** 15896A

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

Client ID #	Lab ID #	Matrix	Date Collected	Dioxins (1613)											
LDW-SS318-010	L9675-4	sediment	10/04/06	X											
LDW-SS321-010	L9675-5	sediment	10/04/06	X											
LDW-SS322-010	L9675-6	sediment	10/04/06	X											
LDW-SS323-010	L9675-7	sediment	10/04/06	X											
LDW-SS324-010	L9675-8	sediment	10/04/06	X											
LDW-SS323-010DUP	L9675-7DUP	sediment	10/04/06	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.

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

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

- Due to compound quantitation %RPD problems, several detected results were qualified as estimated (J) 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).

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 with the following exceptions:

SDG	Date	Compound	%RSD	Associated Samples	Flag	A or P
JZ15 KA18	10/12/06	2,4-Dinitrophenol	30.810	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010 LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS321-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010 LDW-SS316-010DL LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010	J (all detects) UJ (all non-detects)	A

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 with the following exceptions:

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
KA18	10/28/06	Hexachlorocyclopentadiene	26.6	LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010 LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010	J (all detects) UJ (all non-detects)	A
KA18	10/30/06	Hexachlorocyclopentadiene	27.9	LDW-SS316-010DL	J (all detects) UJ (all non-detects)	A

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

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

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
JZ53	MB-101706	10/17/06	Phenol	64 ug/Kg	LDW-SS344-010** LDW-SS342-010** LDW-SS343-010** LDW-SS341-010** LDW-SS339-010** LDW-SS340-010** LDW-SS338-010** LDW-SS336-010** LDW-SS301-010** LDW-SS302-010** LDW-SS305-010** LDW-SS307-010** LDW-SS306-010** LDW-SS308-010** LDW-SS309-010** LDW-SS310-010** LDW-SS311-010** LDW-SS312-010** LDW-SS312-010DL** LDW-SS403-010**

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
JZ53	LDW-SS336-010**	Phenol	250 ug/Kg	250U ug/Kg
JZ53	LDW-SS305-010**	Phenol	85 ug/Kg	85U ug/Kg
JZ53	LDW-SS306-010**	Phenol	120 ug/Kg	120U ug/Kg
JZ53	LDW-SS312-010**	Phenol	75 ug/Kg	75U 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 with the following exceptions:

SDG	Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
KA18	LDW-SS316-010MS/MSD (LDW-SS316-010)	Benzo(g,h,i)perylene	35.5 (40-130)	32.5 (40-130)	-	J (all detects) UJ (all non-detects)	A

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
JZ15	LCS-101606	4-Chloroaniline 3,3'-Dichlorobenzidine	29.3 (40-130) 36.2 (40-130)	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
JZ53	LCS-101706	Aniline	25.4 (40-130)	LDW-SS344-010** LDW-SS342-010** LDW-SS343-010** LDW-SS341-010** LDW-SS339-010** LDW-SS340-010** LDW-SS338-010** LDW-SS336-010** LDW-SS301-010** LDW-SS302-010** LDW-SS305-010** LDW-SS307-010** LDW-SS306-010** LDW-SS308-010** LDW-SS309-010** LDW-SS310-010** LDW-SS311-010** LDW-SS312-010** LDW-SS312-010DL** LDW-SS403-010**	J (all detects) UJ (all non-detects)	P
KA18	LCS-101806	Aniline	34.1 (40-130)	LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS321-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010 LDW-SS316-010DL LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010	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
JZ53	LDW-SS312-010**	Fluoranthene	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A	-
KA18	LDW-SS316-010	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
JZ53 KA18	LDW-SS312-010** LDW-SS316-010	Fluoranthene	R	A
JZ53 KA18	LDW-SS312-010DL** LDW-SS316-010DL	All TCL compounds except Fluoranthene	R	A

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

XVI. Field Duplicates

Samples LDW-SS329-010 and LDW-SS401-010 (SDG JZ15), samples LDW-SS337-010 and LDW-SS402-010 (SDG JZ15), and samples LDW-SS301-010** and LDW-SS403-010** (SDG JZ53) were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS329-010	LDW-SS401-010	
JZ15	Bis(2-ethylhexyl)phthalate	140	180	25 (≤50)
JZ15	Benzo(g,h,i)perylene	68	53	25 (≤50)
JZ15	Phenanthrene	72	39	59 (≤50)
JZ15	Anthracene	36	62U	Not calculable
JZ15	Fluoranthene	170	94	58 (≤50)
JZ15	Pyrene	210	140	40 (≤50)
JZ15	Benzo(a)anthracene	97	49	66 (≤50)
JZ15	Chrysene	170	73	80 (≤50)
JZ15	Benzo(b)fluoranthene	110	100	10 (≤50)
JZ15	Benzo(k)fluoranthene	99	59	51 (≤50)
JZ15	Benzo(a)pyrene	97	63	43 (≤50)
JZ15	Indeno(1,2,3-cd)pyrene	53	38	33 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS337-010	LDW-SS402-010	
JZ15	Bis(2-ethylhexyl)phthalate	140	150	7 (≤50)
JZ15	Benzo(g,h,i)perylene	42	44	5 (≤50)
JZ15	Phenanthrene	46	54	16 (≤50)
JZ15	Fluoranthene	130	140	7 (≤50)
JZ15	Pyrene	100	110	10 (≤50)
JZ15	Benzo(a)anthracene	46	52	12 (≤50)
JZ15	Chrysene	71	78	9 (≤50)
JZ15	Benzo(b)fluoranthene	65	72	10 (≤50)
JZ15	Benzo(k)fluoranthene	62	55	12 (≤50)
JZ15	Benzo(a)pyrene	49	60	20 (≤50)
JZ15	Indeno(1,2,3-cd)pyrene	37	35	6 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS301-010**	LDW-SS403-010 **	
JZ53	Phenanthrene	130	270	70 (≤50)
JZ53	Anthracene	73	290	120 (≤50)
JZ53	Fluoranthene	350	620	56 (≤50)
JZ53	Pyrene	590	3100	136 (≤50)
JZ53	Benzo(a)anthracene	310	2200	151 (≤50)
JZ53	Bis(2-ethylhexyl)phthalate	190	180	5 (≤50)
JZ53	Chrysene	520	3600	150 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS301-010**	LDW-SS403-010 **	
JZ53	Benzo(b)fluoranthene	520	4600	159 (≤50)
JZ53	Benzo(k)fluoranthene	280	2200	155 (≤50)
JZ53	Benzo(a)pyrene	320	2600	156 (≤50)
JZ53	Indeno(1,2,3-cd)pyrene	120	1100	161 (≤50)
JZ53	Benzo(g,h,i)perylene	110	1000	160 (≤50)
JZ53	Fluorene	61U	39	Not calculable
JZ53	Di-n-Butylphthalate	61U	32	Not calculable

XVII. Field Blanks

Samples LDW-SS344-RB**, LDW-SS308-RB** (SDG JZ53), and sample LDW-SS325-RB (SDG KA18) were identified as rinsate blanks. No semivolatile contaminants were found in these blanks with the following exceptions:

SDG	Rinsate Blank ID	Compound	Concentration (ug/L)
KA18	LDW-SS325-RB	Bis(2-ethylhexyl)phthalate	1.1

Lower Duwamish Waterway Group
Semivolatiles - Data Qualification Summary - SDGs JZ15, JZ53, and KA18

SDG	Sample	Compound	Flag	A or P	Reason
JZ15 KA18	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010 LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS321-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010 LDW-SS316-010DL LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010	2,4-Dinitrophenol	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
KA18	LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010 LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010 LDW-SS316-010DL	Hexachlorocyclopentadiene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
KA18	LDW-SS316-010	Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Compound	Flag	A or P	Reason
JZ15	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010	4-Chloroaniline 3,3'-Dichlorobenzidine	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)
JZ53 KA18	LDW-SS344-010** LDW-SS342-010** LDW-SS343-010** LDW-SS341-010** LDW-SS339-010** LDW-SS340-010** LDW-SS338-010** LDW-SS336-010** LDW-SS301-010** LDW-SS302-010** LDW-SS305-010** LDW-SS307-010** LDW-SS306-010** LDW-SS308-010** LDW-SS309-010** LDW-SS310-010** LDW-SS311-010** LDW-SS312-010** LDW-SS312-010DL** LDW-SS403-010** LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS321-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010 LDW-SS316-010DL LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010	Aniline	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)
JZ53 KA18	LDW-SS312-010** LDW-SS316-010	Fluoranthene	R	A	Overall assessment of data
JZ53 KA18	LDW-SS312-010DL** LDW-SS316-010DL	All TCL compounds except Fluoranthene	R	A	Overall assessment of data

Lower Duwamish Waterway Group
Semivolatiles - Laboratory Blank Data Qualification Summary - SDGs JZ15, JZ53, and KA18

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
JZ53	LDW-SS336-010**	Phenol	250U ug/Kg	A
JZ53	LDW-SS305-010**	Phenol	85U ug/Kg	A
JZ53	LDW-SS306-010**	Phenol	120U ug/Kg	A
JZ53	LDW-SS312-010**	Phenol	75U 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

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

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 .

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.

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% with the following exceptions:

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
JZ15	10/26/06	2,4-Dimethylphenol	38.1	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 MB-101606	J (all detects) UJ (all non-detects)	A
JZ15 KA18	10/27/06	Dibenz(a,h)anthracene	35.9	LDW-SS337-010 LDW-SS402-010 LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard 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
JZ15	10/25/06	2,4-Dimethylphenol Dimethylphthalate N-Nitrosodiphenylamine	37.12 54.92 70.92	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010	J (all detects) UJ (all non-detects)	A

SDG	Date	Compound	%D	Associated Samples	Flag	A or P
JZ53 KA18	11/1/06	Benzyl alcohol	29.24	LDW-SS344-010** LDW-SS342-010** LDW-SS343-010** LDW-SS341-010** LDW-SS339-010** LDW-SS340-010** LDW-SS338-010** LDW-SS336-010** LDW-SS301-010** LDW-SS302-010** LDW-SS305-010** LDW-SS307-010** LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010	J (all detects) UJ (all non-detects)	A

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 with the following exceptions:

SDG	Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
JZ53	LDW-SS302-010**	2-Fluorobiphenyl Terphenyl-d14	36.8 (40-130) 36.4 (40-130)	All base neutral compounds	J (all detects) UJ (all non-detects)	P
JZ53	LDW-SS307-010**	2-Fluorobiphenyl Nitrobenzene-d5	31.1 (40-130) 36.1 (40-130)	All base neutral compounds	J (all detects) UJ (all non-detects)	P
KA18	LDW-SS317-010	2-Fluorobiphenyl Nitrobenzene-d5	38.4 (40-130) 38.4 (40-130)	All base neutral compounds	J (all detects) UJ (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

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

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
JZ15	LCS-101606	2,4-Dimethylphenol	24.4 (40-140)	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010	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 for samples on which a EPA Level IV review was performed. 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

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

XVI. Field Duplicates

Samples LDW-SS329-010 and LDW-SS401-010 (SDG JZ15), samples LDW-SS337-010 and LDW-SS402-010 (SDG JZ15), and samples LDW-SS301-010** and LDW-SS403-010** (SDG JZ53), were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS329-010	LDW-SS401-010	
JZ15	Dibenz(a,h)anthracene	13	9.2	34 (≤50)
JZ15	Dimethylphthalate	6.2	6.2U	Not calculable
JZ15	Butylbenzylphthalate	12	12	0 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS337-010	LDW-SS402-010	
JZ15	Dibenz(a,h)anthracene	6.7	6.8	2 (≤50)
JZ15	Butylbenzylphthalate	20	19	5 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS301-010**	LDW-SS403-010**	
JZ53	Dibenz(a,h)anthracene	50	340	149 (≤50)
JZ53	Butylbenzylphthalate	11	14	24 (≤50)

XVII. Field Blanks

Samples LDW-SS344-RB and LDW-SS308-RB (SDG JZ53) and samples LDW-SS325-RB (SDG KA18) were identified as rinsate blanks. No semivolatile contaminants were found in these blanks with the following exceptions:

SDG	Rinsate Blank ID	Compound	Concentration (ug/L)
KA18	LDW-SS325-RB	Benzyl alcohol	3.0

No benzyl alcohol results were found in the associated samples.

Lower Duwamish Waterway Group
Semivolatiles(SIM) - Data Qualification Summary - SDGs JZ15, JZ53, and KA18

SDG	Sample	Compound	Flag	A or P	Reason
JZ15	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010	2,4-Dimethylphenol	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
JZ15 KA18	LDW-SS337-010 LDW-SS402-010 LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010	Dibenz(a,h)anthracene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
JZ15	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010	2,4-Dimethylphenol Dimethylphthalate N-Nitrosodiphenylamine	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
JZ53 KA18	LDW-SS344-010** LDW-SS342-010** LDW-SS343-010** LDW-SS341-010** LDW-SS339-010** LDW-SS340-010** LDW-SS338-010** LDW-SS336-010** LDW-SS301-010** LDW-SS302-010** LDW-SS305-010** LDW-SS307-010** LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010	Benzyl alcohol	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
JZ53 KA18	LDW-SS302-010** LDW-SS307-010** LDW-SS317-010	1,4-Dichlorobenzene 1,2-Dichlorobenzene N-Nitroso-di-n-propylamine 1,2,4-Trichlorobenzene Hexachlorobutadiene Dimethylphthalate N-Nitrosodiphenylamine Hexachlorobenzene Butylbenzylphthalate Dibenz(a,h)anthracene N-Nitrosodimethylamine Benzyl alcohol	J (all detects) UJ (all non-detects)	P	Surrogate recovery (%R)
JZ15	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010	2,4-Dimethylphenol	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

Lower Duwamish Waterway Group
Semivolatiles(SIM) - Laboratory Blank Data Qualification Summary - SDGs JZ15, JZ53, and KA18

No Sample Data Qualified in these SDGs

Polychlorinated Biphenyls by EPA SW 846 Method 8082

I. Technical Holding Times

All technical holding time requirements were met.

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

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.

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

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which 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
JZ53	LDW-SS305-010**	ZB35	Decachlorobiphenyl	159 (50-150)	All TCL compounds	J (all detects)	P
KA18	LDW-SS321-010	Not specified	Decachlorobiphenyl	192 (50-150)	All TCL compounds	J (all detects)	P

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 within QC limits for SDG JZ53.

Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits in SDGs JZ15 and KA18. 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
JZ53	LDW-SS312-010**	Aroclor-1254	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A
KA18	LDW-SS335-010 LDW-SS317-010 LDW-SS315-010 LDW-SS325-010 LDW-SS326-010	Aroclor-1248 Aroclor-1254 Aroclor-1260	Sample result exceeded calibration range.	Reported result should be within calibration range.	N/A N/A N/A
KA18	LDW-SS316-010 LDW-SS303-010 LDW-SS304-010	Aroclor-1254 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
JZ15	LDW-SS331-010	Aroclor-1260	53	J (all detects)	A
JZ53	LDW-SS340-010**	Aroclor-1260	45	J (all detects)	A
KA18	LDW-SS313-010	Aroclor-1248	51	J (all detects)	A
KA18	LDW-SS320-010	Aroclor-1260	43	J (all detects)	A
KA18	LDW-SS321-010	Aroclor-1260	68	J (all detects)	A
KA18	LDW-SS318-010	Aroclor-1260	51	J (all detects)	A

SDG	Sample	Compound	%RPD	Flag	A or P
KA18	LDW-SS317-010	Aroclor-1248 Aroclor-1254	62 62	N/A N/A	-
KA18	LDW-SS315-010	Aroclor-1248 Aroclor-1254	57 53	N/A N/A	-
KA18	LDW-SS325-010	Aroclor-1248 Aroclor-1254	68 61	N/A N/A	-
KA18	LDW-SS304-010	Aroclor-1254	42	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 pattern of peaks on detected samples were possibly weathered aroclors. The results were reported by the laboratory on the best possible match in SDGs JZ53 and KA18.

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
JZ53	LDW-SS312-010**	Aroclor-1254	R	A
JZ53	LDW-SS312-010DL**	All TCL compounds except Aroclor-1254	R	A
KA18	LDW-SS335-010 LDW-SS317-010 LDW-SS315-010 LDW-SS325-010 LDW-SS326-010	Aroclor-1248 Aroclor-1254 Aroclor-1260	R R R	A
KA18	LDW-SS335-010DL LDW-SS317-010DL LDW-SS315-010DL LDW-SS325-010DL LDW-SS326-010DL	All TCL compounds except Aroclor-1248 Aroclor-1254 Aroclor-1260	R	A

SDG	Sample	Compound	Flag	A or P
KA18	LDW-SS316-010 LDW-SS303-010 LDW-SS304-010	Aroclor-1254 Aroclor-1260	R R	A
KA18	LDW-SS316-010DL LDW-SS303-010DL LDW-SS304-010DL	All TCL compounds except Aroclor-1254 Aroclor-1260	R	A

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

XIV. Field Duplicates

Samples LDW-SS329-010 and LDW-SS401-010 (SDG JZ15), samples LDW-SS337-010 and LDW-SS402-010 (SDG JZ15), and samples LDW-SS301-010** and LDW-SS403-010** (SDG JZ53) were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS329-010	LDW-SS401-010	
JZ15	Aroclor-1248	33	36	9 (≤50)
JZ15	Aroclor-1254	46	43	7 (≤50)
JZ15	Aroclor-1260	45	43	5 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS337-010	LDW-SS402-010	
JZ15	Aroclor-1254	20	16	22 (≤50)
JZ15	Aroclor-1260	20	18	11 (≤50)

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS301-010**	LDW-SS403-010**	
JZ53	Aroclor-1248	32	30U	Not calculable
JZ53	Aroclor-1254	38	49	25 (≤50)
JZ53	Aroclor-1260	38	46	19 (≤50)

XV. Field Blanks

Samples LDW-SS344-RB (SDG JZ53), LDW-SS308-RB (SDG JZ53), and sample LDW-SS325-RB (SDG KA18) were identified as rinsate blanks. No polychlorinated biphenyl contaminants were found in these blanks.

Lower Duwamish Waterway Group
Polychlorinated Biphenyls - Data Qualification Summary - SDGs JZ15, JZ53, and KA18

SDG	Sample	Compound	Flag	A or P	Reason
JZ53 KA18	LDW-SS305-010** LDW-SS321-010	All TCL compounds	J (all detects)	P	Surrogate recovery (%R)
JZ15 JZ53 KA18	LDW-SS331-010 LDW-SS340-010** LDW-SS320-010 LDW-SS321-010 LDW-SS318-010	Aroclor-1260	J (all detects)	A	Compound quantitation and CRQLs (RPD)
KA18	LDW-SS313-010	Aroclor-1248	J (all detects)	A	Compound quantitation and CRQLs (RPD)
JZ53	LDW-SS312-010**	Aroclor-1254	R	A	Overall assessment of data
JZ53	LDW-SS312-010DL**	All TCL compounds except Aroclor-1254	R	A	Overall assessment of data
KA18	LDW-SS335-010 LDW-SS317-010 LDW-SS315-010 LDW-SS325-010 LDW-SS326-010	Aroclor-1248 Aroclor-1254 Aroclor-1260	R R R	A	Overall assessment of data
KA18	LDW-SS335-010DL LDW-SS317-010DL LDW-SS315-010DL LDW-SS325-010DL LDW-SS326-010DL	All TCL compounds except Aroclor-1248 Aroclor-1254 Aroclor-1260	R	A	Overall assessment of data
KA18	LDW-SS316-010 LDW-SS303-010 LDW-SS304-010	Aroclor-1254 Aroclor-1260	R R	A	Overall assessment of data
KA18	LDW-SS316-010DL LDW-SS303-010DL LDW-SS304-010DL	All TCL compounds except Aroclor-1254 Aroclor-1260	R	A	Overall assessment of data

Lower Duwamish Waterway Group
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDGs JZ15, JZ53, and KA18

No Sample Data Qualified in these SDGs

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.

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.

V. Blanks

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

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

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

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.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation 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.

XV. Overall Assessment

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

XVI. Field Duplicates

Samples LDW-SS301-010** and LDW-SS403-010** were identified as field duplicates. No butyltins were detected in any of the samples with the following exceptions:

SDG	Compound	Concentration (ug/Kg)		RPD (Limits)
		LDW-SS301-010**	LDW-SS403-010**	
JZ53	Tributyltin ion	17	14	19 (≤50)
JZ53	Dibutyltin ion	6.9	5.7U	Not calculable

XVII. Field Blanks

Samples LDW-SS344-RB and LDW-SS308-RB were identified as rinsate blanks. No butylin contaminants were found in these blanks.

Lower Duwamish Waterway Group
Butyltins - Data Qualification Summary - SDG JZ53

No Sample Data Qualified in these SDGs

Lower Duwamish Waterway Group
Butyltins - Laboratory Blank Data Qualification Summary - SDG JZ53

No Sample Data Qualified in these SDGs

Metals by EPA SW 846 Methods 200.8/7471A

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.

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
JZ15	LDW-SS330-010MS (LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010 LDW-SS330-010DUP)	Antimony Silver	1.9 (70-130) 36.4 (70-130)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

SDG	Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JZ53	LDW-SS344-010MS (LDW-SS344-010** LDW-SS342-010** LDW-SS343-010** LDW-SS341-010** LDW-SS339-010** LDW-SS340-010** LDW-SS338-010** LDW-SS336-010** LDW-SS301-010** LDW-SS302-010** LDW-SS305-010** LDW-SS307-010** LDW-SS306-010** LDW-SS308-010** LDW-SS309-010** LDW-SS310-010** LDW-SS311-010** LDW-SS312-010** LDW-SS403-010** LDW-SS344-010DUP**)	Antimony	3.4 (70-130)	J (all detects) UJ (all non-detects)	A
KA18	LDW-SS335-010MS (LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS321-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010 LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010 LDW-SS335-010DUP)	Antimony Silver	2.5 (70-130) 17.6 (70-130)	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

Although the percent recoveries of antimony and silver were severely low (<30%) in the MS samples above, the results in all the associated samples were qualified as estimated (J/UJ) since the post spike recoveries for antimony and silver were within the 70-130% QC limits.

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

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

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in these SDGs.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

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 Duplicates

Samples LDW-SS329-010 and LDW-SS401-010 (SDG JZ15), samples LDW-SS337-010 and LDW-SS402-010 (SDG JZ15), and samples LDW-SS301-010** and LDW-SS403-010** (SDG JZ53) were identified as field duplicates. No metal contaminants were detected in any of the samples with the following exceptions:

SDG	Analyte	Concentration (mg/Kg)		RPD (Limits)
		LDW-SS329-010	LDW-SS401-010	
JZ15	Arsenic	8.4	8.9	6 (≤30)
JZ15	Chromium	26.5	38.8	38 (≤30)
JZ15	Cobalt	6.1	6.4	5 (≤30)

SDG	Analyte	Concentration (mg/Kg)		RPD (Limits)
		LDW-SS329-010	LDW-SS401-010	
JZ15	Copper	62..9	41.9	39 (≤30)
JZ15	Lead	303	44	149 (≤30)
JZ15	Mercury	0.06	0.10	50 (≤30)
JZ15	Nickel	18.9	16.9	11 (≤30)
JZ15	Vanadium	39.0	41.1	5 (≤30)
JZ15	Zinc	75	74	1 (≤30)
JZ15	Molybdenum	0.5	0.6	18 (≤30)

SDG	Analyte	Concentration (mg/Kg)		RPD (Limits)
		LDW-SS337-010	LDW-SS402-010	
JZ15	Arsenic	8.8	8.5	3 (≤30)
JZ15	Chromium	23	23	0 (≤30)
JZ15	Cobalt	7.5	7.2	4 (≤30)
JZ15	Copper	30.5	29.6	3 (≤30)
JZ15	Lead	14	13	7 (≤30)
JZ15	Mercury	0.11	0.11	0 (≤30)
JZ15	Nickel	18.9	17.9	5 (≤30)
JZ15	Silver	0.9	0.3U	Not calculable
JZ15	Vanadium	50.6	48.3	5 (≤30)
JZ15	Zinc	85	72	17 (≤30)
JZ15	Molybdenum	0.4	0.3U	Not calculable

SDG	Analyte	Concentration (mg/Kg)		RPD (Limits)
		LDW-SS301-010	LDW-SS403-010	
JZ53	Arsenic	7.8	7.6	3 (≤30)
JZ53	Chromium	15.8	17.8	12 (≤30)
JZ53	Cobalt	4.9	5.0	2 (≤30)
JZ53	Copper	34.5	35.9	4 (≤30)
JZ53	Lead	27	25	8 (≤30)
JZ53	Mercury	0.91	0.16	140 (≤30)
JZ53	Nickel	10.9	11.9	9 (≤30)
JZ53	Vanadium	37.4	40.6	8 (≤30)
JZ53	Zinc	106	74	36 (≤30)
JZ53	Molybdenum	0.5	0.5	0 (≤30)

XIV. Field Blanks

Samples LDW-SS344-RB (SDG JZ53), LDW-SS308-RB (SDG JZ53), and sample LDW-SS325-RB (SDG KA18) were identified as rinsate blanks. No metal contaminants were found in these blanks with the following exceptions:

SDG	Rinsate Blank ID	Analyte	Concentration (ug/L)
JZ53	LDW-SS344-RB	Copper	0.6
JZ53	LDW-SS308-RB	Copper	1.5
KA18	LDW-SS325-RB	Copper Zinc	2.2 5

Lower Duwamish Waterway Group
Metals - Data Qualification Summary - SDGs JZ15, JZ53, and KA18

SDG	Sample	Analyte	Flag	A or P	Reason
JZ15 KA18	LDW-SS330-010 LDW-SS327-010 LDW-SS328-010 LDW-SS329-010 LDW-SS401-010 LDW-SS331-010 LDW-SS332-010 LDW-SS334-010 LDW-SS333-010 LDW-SS337-010 LDW-SS402-010 LDW-SS335-010 LDW-SS313-010 LDW-SS314-010 LDW-SS322-010 LDW-SS323-010 LDW-SS320-010 LDW-SS319-010 LDW-SS324-010 LDW-SS321-010 LDW-SS318-010 LDW-SS317-010 LDW-SS316-010 LDW-SS315-010 LDW-SS303-010 LDW-SS325-010 LDW-SS326-010 LDW-SS304-010 LDW-SS330-010DUP LDW-SS335-010DUP	Antimony Silver	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
JZ53	LDW-SS344-010** LDW-SS342-010** LDW-SS343-010** LDW-SS341-010** LDW-SS339-010** LDW-SS340-010** LDW-SS338-010** LDW-SS336-010** LDW-SS301-010** LDW-SS302-010** LDW-SS305-010** LDW-SS307-010** LDW-SS306-010** LDW-SS308-010** LDW-SS309-010** LDW-SS310-010** LDW-SS311-010** LDW-SS312-010** LDW-SS403-010** LDW-SS344-010DUP**	Antimony	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

Lower Duwamish Waterway Group
Metals - Laboratory Blank Data Qualification Summary - SDGs JZ15, JZ53, and KA18

No Sample Data Qualified in these SDGs

Total Organic Carbon by Plumb Method
Total Solids by EPA Method 160.3
Grain Size by PSEP Method

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

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

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 Duplicates

Samples LDW-SS329-010 and LDW-SS401-010 (SDG JZ15), samples LDW-SS337-010 and LDW-SS402-010 (SDG JZ15), and samples LDW-SS301-010** and LDW-SS403-010** (SDG JZ53) were identified as field duplicates. No concentrations were detected in any of the samples with the following exceptions:

SDG	Analyte	Concentration (%)		RPD (Limits)
		LDW-SS329-010	LDW-SS401-010	
JZ15	Total solids	70.30	68.80	2 (≤20)
JZ15	Total organic carbon	0.972	1.59	48 (≤30)

SDG	Analyte	Concentration (%)		RPD (Limits)
		LDW-SS337-010	LDW-SS402-010	
JZ15	Total solids	55.80	56.10	1 (≤20)
JZ15	Total organic carbon	2.20	2.16	2 (≤30)

SDG	Analyte	Percent Finer Than Indicated Size		RPD (Limits)
		LDW-SS329-010	LDW-SS401-010	
JZ15	Gravel (-2)	100	99.4	1 (≤30)
JZ15	Gravel (-1)	98.4	97.8	1 (≤30)
JZ15	Very Coarse Sand (0)	96.5	96.3	0 (≤30)
JZ15	Coarse Sand (1)	86.1	86.1	0 (≤30)
JZ15	Medium Sand (2)	71.8	46.2	43 (≤30)

SDG	Analyte	Percent Finer Than Indicated Size		RPD (Limits)
		LDW-SS329-010	LDW-SS401-010	
JZ15	Fine Sand (3)	46.2	34.5	29 (≤30)
JZ15	Very Fine Sand (4)	26.5	26.2	1 (≤30)
JZ15	Silt (5)	22.1	21.5	3 (≤30)
JZ15	Silt (6)	17.0	16.7	2 (≤30)
JZ15	Silt (7)	11.4	11.4	0 (≤30)
JZ15	Silt (8)	7.8	7.8	0 (≤30)
JZ15	Clay (9)	5.3	5.4	2 (≤30)
JZ15	Clay (10)	3.5	3.6	3 (≤30)

SDG	Analyte	Percent Finer Than Indicated Size		RPD (Limits)
		LDW-SS337-010	LDW-SS402-010	
JZ15	Gravel (-2)	99.8	100	0 (≤30)
JZ15	Gravel (-1)	99.8	99.8	0 (≤30)
JZ15	Very Coarse Sand (0)	98.9	99.2	0 (≤30)
JZ15	Coarse Sand (1)	97.5	97.7	0 (≤30)
JZ15	Medium Sand (2)	94.9	94.9	0 (≤30)
JZ15	Fine Sand (3)	70.9	71.3	1 (≤30)
JZ15	Very Fine Sand (4)	46.7	46.4	1 (≤30)
JZ15	Silt (5)	32.7	30.8	6 (≤30)
JZ15	Silt (6)	21.0	19.9	5 (≤30)
JZ15	Silt (7)	13.0	12.5	4 (≤30)

SDG	Analyte	Percent Finer Than Indicated Size		RPD (Limits)
		LDW-SS337-010	LDW-SS402-010	
JZ15	Silt (8)	8.2	8.1	1 (≤30)
JZ15	Clay (9)	6.0	5.9	2 (≤30)
JZ15	Clay (10)	4.3	4.2	2 (≤30)

SDG	Analyte	Concentration (%)		RPD (Limits)
		LDW-SS301-010**	LDW-SS403-010**	
JZ53	Total solids	67.50	66.80	1 (≤20)
JZ53	Total organic carbon	1.55	1.95	23 (≤30)

SDG	Analyte	Percent Finer Than Indicated Size		RPD (Limits)
		LDW-SS301-010	LDW-SS403-010	
JZ53	Gravel (-2)	97.1	98.0	1 (≤30)
JZ53	Gravel (-1)	91.4	92.8	2 (≤30)
JZ53	Very Coarse Sand (0)	87.7	88.8	1 (≤30)
JZ53	Coarse Sand (1)	78.1	79.1	1 (≤30)
JZ53	Medium Sand (2)	41.2	41.6	1 (≤30)
JZ53	Fine Sand (3)	22.4	21.9	2 (≤30)
JZ53	Very Fine Sand (4)	18.2	17.8	2 (≤30)
JZ53	Silt (5)	15.6	14.8	5 (≤30)
JZ53	Silt (6)	12.2	11.7	4 (≤30)
JZ53	Silt (7)	8.6	8.3	4 (≤30)
JZ53	Silt (8)	6.0	5.7	5 (≤30)
JZ53	Clay (9)	4.2	4.0	5 (≤30)

SDG	Analyte	Percent Finer Than Indicated Size		RPD (Limits)
		LDW-SS301-010	LDW-SS403-010	
JZ53	Clay (10)	2.7	2.5	8 (≤30)

X. Field Blanks

Samples LDW-SS344-RB (SDG JZ53) and LDW-SS308-RB (SDG JZ53) were identified as rinsate blanks. No contaminant concentrations were found in these blanks.

Lower Duwamish Waterway Group
Wet Chemistry - Data Qualification Summary - SDGs JZ15, JZ53, and KA18

No Sample Data Qualified in these SDGs

Lower Duwamish Waterway Group
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDGs JZ15, JZ53, and KA18

No Sample Data Qualified in these SDGs

HRGC/HRMS Dioxins/Dibenzofurans By EPA Method 1613B

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:

Associated SDG	Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
DPWG20754/ WG20336	WG20336-101	10/18/06	1,2,3,4,6,7,8-HpCDD OCDD 2,3,4,7,8-PeCDF OCDF Total HpCDD	0.057 ng/Kg 0.069 ng/Kg 0.050 ng/Kg 0.057 ng/Kg 0.057 ng/Kg	LDW-SS318-010 LDW-SS321-010 LDW-SS322-010 LDW-SS323-010 LDW-SS324-010 LDW-SS323-010DUP

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:

Associated SDG	Sample	Compound	Flag	A or P
DPWG20754/ WG20336	LDW-SS321-010 LDW-SS323-010	1,2,3,7,8,9-HxCDF was 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:

Associated SDG	Sample	Compound	Flag	A or P
DPWG20754/ WG20336	LDW-SS318-010 LDW-SS321-010 LDW-SS322-010 LDW-SS323-010 LDW-SS324-010 LDW-SS323-010DUP	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 DPWG20754/WG20336

SDG	Sample	Compound	Flag	A or P	Reason
DPWG20754/ WG20336	LDW-SS321-010 LDW-SS323-010	1,2,3,7,8,9-HxCDF was reported by the lab as estimated (K) maximum possible concentration (EMPC)	U	A	Compound quantitation and CRQLs (EMPC)
DPWG20754/ WG20336	LDW-SS318-010 LDW-SS321-010 LDW-SS322-010 LDW-SS323-010 LDW-SS324-010 LDW-SS323-010DUP	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 DPWG20754/WG20336

No Sample Data Qualified in this SDG

LDC #: 15720A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/8/06
SDG #: JZ15 Level III Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C/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: 10/2/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	
IV.	Continuing calibration	A	ICV ≤ 25
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples /SRM	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 4 + 5 10 + 11
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

1	LDW-SS330-010	11	LDW-SS402-010	21	MB-101606	31	
2	LDW-SS327-010	12	LDW-SS337-010MS	22		32	
3	LDW-SS328-010	13	LDW-SS337-010MSD	23		33	
4	LDW-SS329-010	14		24		34	
5	LDW-SS401-010	15		25		35	
6	LDW-SS331-010	16		26		36	
7	LDW-SS332-010	17		27		37	
8	LDW-SS334-010	18		28		38	
9	LDW-SS333-010	19		29		39	
10	LDW-SS337-010	20		30		40	

GPC - clean up performed

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 #: 15720A2a
SDG #: JZ15
METHOD: GC/MS BNA (EPA SW 846 Method 8270)

VALIDATION FINDINGS WORKSHEET
Initial Calibration

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

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

- (Y) N N/A Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?
- (Y) N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
- Y (N) N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?________
- (Y) N N/A Did the initial calibration meet the acceptance criteria?
- Y (N) N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	10/12/06	ICAL	HH	30.810		All + Blank	J/UJ/A

LDC #: 15720A2a
SDG #: JZ15

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: FT
2nd Reviewer: a

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

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

(Y) N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LCS-101606	T	29.3 (40-130)	( )	( )	All + BL	J/UJ/P
			BBB	36.2 (↓)	( )	( )	↓	↓
				( )	( )	( )	— — —	—

LCSLCSD.2S

LDC#: 15720A2a
SDG#: JZ15

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: EJ
2nd Reviewer: M

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

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)		≤ 50	
	4	5	RPD	
bis (2-Ethylhexyl) phthalate	140	180	25	
Benzo (g,h,i) perylene	68	53	25	
Phenanthrene	72	39	59	
Anthracene	36	62u	~~200~~ NC	
Fluoranthene	170	94	58	
Pyrene	210	140	40	
Benzo(a)anthracene	97	49	66	
Chrysene	170	73	80	
Benzo(b)fluoranthene	110	100	10	
Benzo(k)fluoranthene	99	59	51	
Benzo(a)pyrene	97	63	43	
Indeno(1,2,3-cd)pyrene	53	38	33	

LDC#: 15720A2a
SDG#: JZ15

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: F7
2nd Reviewer: A

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

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)		≤ 50	
	10	11	RPD	
Bis (2-Ethylhexyl) phthalate	140	150	7	
Benzo (g,h,i) perylene	42	44	5	
Phenanthrene	46	54	16	
Fluoranthene	130	140	7	
Pyrene	100	110	10	
Benzo(a)anthracene	46	52	12	
Chrysene	71	78	9	
Benzo(b)fluoranthene	65	72	10	
Benzo(k)fluoranthene	62	55	12	
Benzo(a)pyrene	49	60	20	
Indeno(1,2,3-cd)pyrene	37	35	6	

V:\FIELD DUPLICATES\Windward\15720A2a.wpd

LDC #: 15767A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/15/06
SDG #: JZ53 Level IV Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C) 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: 10/3/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	ICV ≤ 25
IV.	Continuing calibration	A	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples /SRM	SW	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	SW	
XVI.	Field duplicates	SW	D = 10 + 22
XVII.	Field blanks	ND	RB = 1 + 16

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 + water

1	LDW-SS344-RB	W	11	LDW-SS302-010	S	21	LDW-SS312-010DL	S	31 / MB-101706
2	LDW-SS344-010	S	12	LDW-SS305-010		22	LDW-SS403-010		32
3	LDW-SS342-010		13	LDW-SS307-010		23	LDW-SS306-010MS		33
4	LDW-SS343-010		14	LDW-SS306-010		24	LDW-SS306-010MSD		34
5	LDW-SS341-010		15	LDW-SS308-010		25			35
6	LDW-SS339-010		16	LDW-SS308-RB	W	26			36
7	LDW-SS340-010		17	LDW-SS309-010	S	27			37
8	LDW-SS338-010		18	LDW-SS310-010		28			38
9	LDW-SS336-010		19	LDW-SS311-010		29			39
10	LDW-SS301-010		20	LDW-SS312-010		30			40

LDC #: 15767A2a
SDG #: JZ53

VALIDATION FINDINGS CHECKLIST

Reviewer: JB
2nd Reviewer: AC

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 #: 15767A2a
SDG #: J753

VALIDATION FINDINGS CHECKLIST

Reviewer: JB
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?		✓		
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 #: 15767A2a
SDG #: 1253

VALIDATION FINDINGS WORKSHEET
Blanks

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

Blank extraction date: 10/17/06 **Blank analysis date:** 10/31/06
Conc. units: ug/kg Associated Samples: All sediments

Compound	Blank ID	Sample Identification								
	MB-101706	9	12	14	20					
A	64	250/U	85/U	120/U	75/U					

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

Compound	Blank ID	Sample Identification								

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

LDC #: 15767A2a
SDG #: J253

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
			PHL	30.9 (40 - 130)	no QUAL
				( )	
		8	TPH	39.2 (↓)	↓
				( )	
		16	PHL	31.2 (↓)	↓
				( )	
				( )	
		MB - 101006	PHL	38.7 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* 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	19-94
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 #: 15767A2a
SDG #: 1253

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: B
2nd Reviewer: L

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-101706	NNN	25.4 (40-130)	( )	( )	all sediments	J/UJ/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 15767A2a
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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
		YY	exceeded cal Range	20	N/A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15767A2a
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: P
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
		YY	exceeded cal Range	2D	R/A
		all except YY	diluted	21	R/A

Comments: _____

LDC#:15767A2a
SDG#:JZ53

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GCMS method 8270D

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)		≤ 50 RPD	
	10	22		
Phenanthrene	130	270	70	
Anthracene	73	290	120	
Fluoranthene	350	620	56	
Pyrene	590	3100	136	
Benzo (a) anthracene	310	2200	~~200~~ 157	
bis (2-Ethylhexyl) phthalate	190	180	5	
Chrysene	520	3600	150	
Benzo (b) fluoranthene	520	4600	159	
Benzo (k) fluoranthene	280	2200	155	
Benzo (a) pyrene	320	2600	156	
Indeno (1,2,3-cd) pyrene	120	1100	161	
Benzo (g,h,i) perylene	110	1000	160	
Fluorene	61u	39	~~200~~ NC	
Di-n-Butylphthalate	61u	32	~~200~~ ↓	

LDC #: 15767A29
SDG #: J253

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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

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

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

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (25 std)	Recalculated RRF (25 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/12/06	Phenol (1st internal standard)	2.247	2.247	2.279	2.279	7.4	7.4
			Naphthalene (2nd internal standard)	1.076	1.076	1.088	1.088	5.3	5.3
			Fluorene (3rd internal standard)	1.384	1.384	1.376	1.376	2.9	2.9
			~~Acenaphthene~~ Pentachlorophenol (4th internal standard)	1.224	1.224	1.231	1.231	3.1	3.1
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.499	0.499	0.499	0.499	2.0	2.0
			Benzo(a)pyrene (6th internal standard)	1.153	1.153	1.169	1.169	4.3	4.3
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

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

LDC #: 15767A2a
SDG #: JZ53

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	CCV	10/17/06	Phenol (1st internal standard)	2.279	2.240	2.240	1.7	1.7
	0957		Naphthalene (2nd internal standard)	1.088	1.088	1.088	0.0	0.0
			Fluorene (3rd internal standard)	1.376	1.359	1.359	1.2	1.2
			~~Pentachlorophenol~~ Anthracene (4th internal standard)	1.231	1.226	1.226	0.4	0.4
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.499	0.483	0.483	3.2	3.2
			Benzo(a)pyrene (6th internal standard)	1.169	1.160	1.160	0.8	0.8
2	CCV	10/30/06	Phenol (1st internal standard)		2.002	2.002	12.2	12.2
	1509		Naphthalene (2nd internal standard)		1.085	1.085	0.3	0.3
			Fluorene (3rd internal standard)		1.362	1.362	1.0	1.0
			~~Pentachlorophenol~~ Anthracene (4th internal standard)		1.200	1.200	2.5	2.5
			Bis(2-ethylhexyl)phthalate (5th internal standard)		0.5100	0.5100	2.2	2.2
			Benzo(a)pyrene (6th internal standard)		1.154	1.154	1.3	1.3
3	CCV	10/31/06	Phenol (1st internal standard)		2.035	2.035	10.7	10.7
	0940		Naphthalene (2nd internal standard)		1.082	1.082	0.6	0.6
			Fluorene (3rd internal standard)		1.345	1.345	2.2	2.2
			~~Pentachlorophenol~~ Anthracene (4th internal standard)		1.204	1.204	2.2	2.2
			Bis(2-ethylhexyl)phthalate (5th internal standard)		0.491	0.491	1.6	1.6
			Benzo(a)pyrene (6th internal standard)		1.147	1.147	1.9	1.9

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 #: 15767A2a
SDG #: 1253

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: 5

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	1525	871.0	57.2	57.1	0
2-Fluorobiphenyl	1525	867.9	56.8	56.9	
Terphenyl-d14	1525	806.8	52.8	52.8	
Phenol-d5	2288	1274	55.7	55.7	
2-Fluorophenol	2288	1244	54.4	54.4	
2,4,6-Tribromophenol	2288	1350	58.9	59.0	
2-Chlorophenol-d4	2288	1269	55.5	55.5	
1,2-Dichlorobenzene-d4	1525	845.4	55.6	55.4	

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 #: 15767A29
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 19
2nd Reviewer: AL

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

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

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

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

MS/MSD samples: 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	2280	2260	122	1280	1350	50.8	50.8	54.3	54.3	5.3	5.3
~~N-Nitroso-di-n-propylamine~~											
4-Chloro-3-methylphenol	2280	2260	ND	1540	1600	67.5	67.5	70.8	70.8	3.8	3.8
Acenaphthene	1520	1500	ND	985	1050	64.8	64.8	70.0	70.0	6.4	6.4
~~Pentachlorophenol~~											
Pyrene	1520	1500	ND	962	1010	63.3	63.3	67.3	67.3	4.9	4.9

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 #: 15767A2a
SDG #: JZ53

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: LCS – 101706

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	1560	NA	1080	NA	69.2	69.2				
N-Nitroso-di-n-propylamine										
4-Chloro-3-methylphenol	1560		1190		76.3	76.3				
Acenaphthene	1560		1190		76.3	76.3				
Pentachlorophenol										
Pyrene	1560		1250		80.1	80.1	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 #: 15767A2a
SDG #: JE53

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. 5, Phenanthrene

Conc. = $\frac{(28211)(20)(2000)}{(378663)(1.244)(32.8)}$ = 73 ug/kg

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

LDC #: 15767B2a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/14/06
SDG #: KA18 Level III Page: 1 of 7
Laboratory: Analytical Resources, Inc. Reviewer: B
2nd Reviewer: A

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: 10/4/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	
IV.	Continuing calibration	SW	ICV ≤ 25
V.	Blanks	~~SW~~ A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	SW	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	RB = 16

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 & water

1	LDW-SS335-010	11	LDW-SS317-010	21	LDW-SS316-010MSD	31	MB - 101806
2	LDW-SS313-010	12	LDW-SS316-010	22		32	MB - 101106
3	LDW-SS314-010	13	LDW-SS316-010DL	23		33	
4	LDW-SS322-010	14	LDW-SS315-010	24		34	
5	LDW-SS323-010	15	LDW-SS303-010	25		35	
6	LDW-SS320-010	16	LDW-SS325-RB W	26		36	
7	LDW-SS319-010	17	LDW-SS325-010	27		37	
8	LDW-SS324-010	18	LDW-SS326-010	28		38	
9	LDW-SS321-010	19	LDW-SS304-010	29		39	
10	LDW-SS318-010	20	LDW-SS316-010MS	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 #: 15767B2a
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 7
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 Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?
(Y) N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y (N) N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? r
(N) N N/A Did the initial calibration meet the acceptance criteria?
Y (N) N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	10/12/06	ICAL	HH	30.810		All samples except Blank	J/UJ/A

LDC #: 15767B2a
SDG #: KA1B

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	10/28/06	cc1028	X	26.6		1→8, 10→12, 14,15,17→19	J/UJ/A
	10/30/06	cc1030	X	27.9		13	↓

CONCAL2S

LDC #: 15767B2a
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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
		14	TPH	37.8 (40-130)	NO QUAL
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory

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

LDC #: 15767B2a
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20+21	ZZ	0 (40-130)	0 (40-130)	( )	12	NO QUAL
			↓	( )	( )	( )		parent 72x spike Amt
				( )	( )	( )		
			LLL	35.5 (↓)	32.5 (↓)	( )	↓	J/UJ/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 #: 15767B2a
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LCS-101806	NNN	34.1 (40-130)	( )	( )	~~MB-101806~~, All sediments except B/K	J/UJ/P

LDC #: 15767B2a
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: 17
2nd Reviewer: d

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
		YY	exceeded cal Range	12	NA

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15767B2a
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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

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

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

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

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

#	Date	~~Sample ID~~ compound	Finding	Associated Samples	Qualifications
		YY	exceeded cal Range	12	R/A
		all except above	diluted	13	R/A

Comments: _____

OVR.2S

LDC #: 15767B2a
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds identified in the field blanks?

Sample: 16 Field Blank / Trip Blank / ~~Rinsate~~ RB (circle one)

Compound	Concentration Units (ug/L)
EEE	1.1

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

LDC #: 15720A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/8/06
SDG #: JZ15 Level III Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: P
2nd Reviewer: L

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: 10/2/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD, r^2 ≥ 0.990
IV.	Continuing calibration	SW	ICV ≤ 25
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples /SRM	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 4 & 5 10 & 11
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

1	LDW-SS330-010	11	LDW-SS402-010	21	MB-101606	31	
2	LDW-SS327-010	12	LDW-SS337-010MS	22		32	
3	LDW-SS328-010	13	LDW-SS337-010MSD	23		33	
4	LDW-SS329-010	14		24		34	
5	LDW-SS401-010	15		25		35	
6	LDW-SS331-010	16		26		36	
7	LDW-SS332-010	17		27		37	
8	LDW-SS334-010	18		28		38	
9	LDW-SS333-010	19		29		39	
10	LDW-SS337-010	20		30		40	

VALIDATION FINDINGS WORKSHEET

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

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

LDC #: 15720A26
SDG #: JZ15

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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
	10/25/06	ICV 1025	θ	37.12		All + BK	J/UJ/A
			CC	54.92		↓	↓
			QQ	70.92			
	10/26/06 10:01	CC1026-CCV	θ	38.1		1 → 9, MB-101606	J/UJ/A
	10/27/06 15:36	CC1027-CCV	KKK	35.9		10 → 13	J/UJ/A

LDC #: 15720A26
SDG #: JZ15

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Reviewer:
2nd Reviewer:

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

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	NBZ	28.2 (40 - 140)	no qual
				( )	
		2	↓	32.8 (↓)	↓
				( )	
		3	↓	30.0 (↓)	↓
				( )	
		4	↓	33.1 (↓)	↓
				( )	
		5	↓	32.3 (↓)	↓
				( )	
		6	↓	31.3 (↓)	↓
				( )	
		7	↓	27.9 (↓)	↓
				( )	
		8	↓	36.1 (↓)	↓
				( )	
		9	↓	32.3 (↓)	↓
				( )	
		10	↓	31.3 (↓)	↓
				( )	
		11	↓	31.8 (↓)	↓
				( )	
				( )	
				( )	

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

LDC #: 15720A2b
SDG #: JZ15

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: P
2nd Reviewer: q

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

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

(Y) N N/A 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-101606	O	24.4 (40-140)	( )	( )	All + Blk	J/UJ/P
				( )	( )	( )		
				( )	( )	( )	— — —	—
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 15720A26
SDG #: JZ15

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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

Compound	Concentration (ug/kg)		≤ 50 RPD
	4	5	
KKK	13	9.2	34
CC	6.2	6.24	~~200~~ NC
AAA	12	12	0

Compound	Concentration (ug/kg)		≤ 50 RPD
	10	11	
KKK	6.7	6.8	2
AAA	20	19	5

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 15767A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/14/06
SDG #: JZ53 Level IV 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: 10/3/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD, r^2 ≥0.990
IV.	Continuing calibration	SW	ICV ≤ 25
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples /SRM FISW A	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	
XII.	Compound quantitation/CRQLs	A	
XIII.	Tentitatively identified compounds (TICs)	N	not Reported
XIV.	System performance	A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	10 + 21
XVII.	Field blanks	ND	RB = 1, 16

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 + water

1	LDW-SS344-RB W	11	LDW-SS302-010 S	21	LDW-SS403-010 S	31	MB-101706
2	LDW-SS344-010 S	12	LDW-SS305-010	22	LDW-SS306-010MS	32	MB-101806
3	LDW-SS342-010	13	LDW-SS307-010	23	LDW-SS306-010MSD	33	
4	LDW-SS343-010	14	LDW-SS306-010	24		34	
5	LDW-SS341-010	15	LDW-SS308-010	25		35	
6	LDW-SS339-010	16	LDW-SS308-RB W	26		36	
7	LDW-SS340-010	17	LDW-SS309-010 S	27		37	
8	LDW-SS338-010	18	LDW-SS310-010	28		38	
9	LDW-SS336-010	19	LDW-SS311-010	29		39	
10	LDW-SS301-010	20	LDW-SS312-010	30		40	

LDC #: 15767A26
SDG #: J753

VALIDATION FINDINGS CHECKLIST

Reviewer: F
2nd Reviewer: A

Method: Semivolatiles (EPA SW 846 Method 8270C) SIM

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 #: 15767A26
SDG #: J253

VALIDATION FINDINGS CHECKLIST

Reviewer: EV
2nd Reviewer: AC

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) SIM

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 #: 15767A26
SDG #: J253

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	10/26/06	CC1026	~~O~~	38.1		~~All water + MB-101006 P~~	~~J/UJ/A~~ N
	11/1/06	ICV1101	QQQ	29.24		2 → 13	J/UJ/A
	10/25/06	ICV1025	~~QQQ~~	40.16		~~All water + MB-101006 P~~	~~J/UJ/A~~
			O	37.12			
			CC	54.92			
			~~QQ~~	70.92			

LDC #: 15767 A25
SDG #: J253

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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

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

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
		8	TPH	36.2 (40-130)	no QUAL
				( )	
		11	FBP	36.8 (↓)	J/NJ/P QUAL All B/N
			TPH	36.4 (↓)	
				( )	
		12	FBP	36.9 (40-130)	no QUAL
				( )	
		13	FBP	31.1 (↓)	J/NJ/P QUAL All B/N
			TBP	39.5 (↓)	
			NBZ	36.1 (↓)	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

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

LDC #: 15767A26
SDG #: J753

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: P
2nd reviewer:

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

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

Compound	Concentration (ug/kg)		≤ 50 RPD
	10	21	
KKK	50	340	149
AAA	11	14	24

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC# 15767A26
SDG# J253

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: 8270SIM

Callibration Date	Column/ Detector	Compound	Standard	Y	X
10/25/06	GCMS	Dimethylthphalate	Point 1	0.0736340945	0.05
			Point 2	0.3346058796	0.25
			Point 3	0.7596718216	0.5
			Point 4	1.54879891	1.25
			Point 5	2.815998469	2.5
			Point 6	5.1375934352	5
			Point 7		
			Point 7		
			Point 8		

	Recalculated Result		Result Reported by the Lab	
Regression Output:				
Constant	0		0	
Std Err of Y Est	0.1800163973928209			
R Squared	0.99121		0.992	
No. of Observations	6			
Degrees of Freedom	5			
X Coefficient(s)	1.06048241102818	-4.709533374922748		1.06509
Std Err of Coef.	0.03127647028597	0.9001142278087764		

2 of Y

LDC# 15767A26
SDG# J253

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: 8270SIM

Callibration Date	Column/ Detector	Compound	Standard	Y	X
11/01/06	GCMS	Benzyl Alcohol	Point 1	0.0594781139	0.05
			Point 2	0.2945850298	0.25
			Point 3	0.656939863	0.5
			Point 4	1.9166307774	1.25
			Point 5	4.1104257298	2.5
			Point 6	8.678557657	5
			Point 7		
			Point 7		
			Point 8		

	Recalculated Result		Result Reported by the Laborato	
Regression Output:				
Constant	0		0	
Std Err of Y Est	0.1726306662894031			
R Squared	0.99730		0.99662	
No. of Observations	6			
Degrees of Freedom	5			
X Coefficient(s)	1.70461795111601	-4.709533374922748		1.70728
Std Err of Coef.	0.02999325607469	0.9001142278087764		

3 of Y

LDC# 15767A26
SDG# J753

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: 8270SIM

Callibration Date	Column/ Detector	Compound	Standard	Y	X
11/01/06	GCMS	Dimethylthphtalate	Point 1	0.1607317499	0.05
			Point 2	0.5057958744	0.25
			Point 3	0.9764078877	0.5
			Point 4	2.3047845822	1.25
			Point 5	4.4068839915	2.5
			Point 6	8.9297711996	5
			Point 7		
			Point 7		
			Point 8		

	Recalculated Result		Result Reported by the Laborato	
Regression Output:				
Constant	0		0	
Std Err of Y Est	0.06953771186691			
R Squared	0.99957		0.99958	
No. of Observations	6			
Degrees of Freedom	5			
X Coefficient(s)	1.78612138568295	-4.709533374922748		1.78653
Std Err of Coef.	0.01208164484157	0.9001142278087764		

LDC #: 15767A26
SDG #: J753

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: D
2nd Reviewer: A

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

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 (2.0 std)	Recalculated RRF (2.5 std)	Reported Average RRF (Initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/25/06	~~Phenol~~ (1st internal standard) Benzyl Alcohol	1.33288	1.33288	1.25284	1.25284	8.50291	8.50291
			~~Naphthalene~~ (2nd internal standard) 1,2,4-Trichlorobenzene	0.38868	0.38868	0.41552	0.41552	4.95277	4.95277
			~~Fluorene~~ (3rd internal standard) Dimethylphthalate	see curve					
			Pentachlorophenol (4th internal standard)	0.13462	0.13462	0.11440	0.11440	14.183	14.183
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard) Butylbenzylphthalate	0.63342	0.63342	0.58374	0.58374	5.012	5.012
			~~Benzo(a)pyrene~~ (6th internal standard) Dibenzo(a,h)anthracene	1.15710	1.15710	1.16346	1.16346	4.3667	4.3667
2	ICAL	11/1/06	~~Phenol~~ (1st internal standard) Benzyl Alcohol	see curve					
			~~Naphthalene~~ (2nd internal standard) 1,2,4-Trichlorobenzene	0.68037	0.68037	0.73262	0.73262	11.4178	11.4178
			~~Fluorene~~ (3rd internal standard) Dimethylphthalate	see curve					
			Pentachlorophenol (4th internal standard)	0.10828	0.10828	0.10300	0.10300	28.6119	28.6119
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard) Butylbenzylphthalate	0.56327	0.56327	0.60269	0.60269	6.72319	6.72319
			~~Benzo(a)pyrene~~ (6th internal standard) Dibenzo(a,h)anthracene	1.13595	1.13595	1.13891	1.13891	6.61906	6.61906
3	ICAL	11/3/06	~~Phenol~~ (1st internal standard) Benzyl Alcohol	1.49655	1.49655	1.53974	1.53974	10.637	10.637
			~~Naphthalene~~ (2nd internal standard) 1,2,4-Trichlorobenzene	0.15342	0.15342	0.18061	0.18061	22.869	22.869
			~~Fluorene~~ (3rd internal standard) Dimethylphthalate	0.93255	0.93255	0.95680	0.95680	15.855	15.855
			Pentachlorophenol (4th internal standard)	0.13029	0.13029	0.12288	0.12288	9.533	9.533
			~~Bis(2-ethylhexyl)phthalate~~ (5th internal standard) Butylbenzylphthalate	0.64075	0.64075	0.64001	0.64001	8.325	8.325
			~~Benzo(a)pyrene~~ (6th internal standard) Dibenzo(a,h)anthracene	1.13420	1.13420	1.16549	1.16549	7.091	7.091

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 #: 15767A26
SDG #: J753

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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

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	10/26/06 1001	~~Phenol~~ Benzyl Alcohol (1st internal standard)	1.25284	1.31467	1.3146	4.93	4.93
			~~Naphthalene~~ 1,2,4-Trichlorobenzene (2nd internal standard)	0.41556	0.37875	0.3787	8.857	8.86
			~~Fluorene~~ Dimethylphthalate (3rd internal standard)	2.50	3.023	3.023	20.9	20.9
			Pentachlorophenol (4th internal standard)	0.11440	0.11669	0.11669	2.005	2.01
			~~Bis(2-ethylhexyl)phthalate~~ Butyl Benzyl phthalate (5th internal standard)	0.58374	0.60120	0.60120	2.9918	2.99
			~~Benzo(a)pyrene~~ Benzo (a,h) Anthracene (6th internal standard)	1.16346	1.14631	1.14631	1.434	1.474
2	CCV	11/1/06 1345	~~Phenol (1st internal standard)~~	2.50	2.062	2.062	17.5	17.5
			Naphthalene (2nd internal standard)	0.73262	0.71967	0.71967	1.76828	1.76828
			Fluorene (3rd internal standard)	2.5	2.425	2.425	3.0	3.0
			Pentachlorophenol (4th internal standard)	0.103	0.09985	0.09985	3.0539	3.0539
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.60269	0.57952	0.57952	3.844	3.844
			~~Benzo(a)pyrene~~ (6th internal standard) ✓	1.13891	1.08112	1.08112	5.0739	5.0739
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 #: 15767A26
SDG #: J753

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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: 4

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	1511	933.0	61.6	61.6	0
2-Fluorobiphenyl	1511	825.0	54.8	54.8	
Terphenyl-d14	1511	688.0	45.6	45.6	
Phenol-d5	2267	1553	68.5	68.5	
2-Fluorophenol	2267	2323	102	102	
2,4,6-Tribromophenol	2267	1436	63.5	63.5	
2-Chlorophenol-d4	2267	1872	82.7	82.7	
1,2-Dichlorobenzene-d4	1511	936.1	62.0	62.0	

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 #: 15767A26
SDG #: J753

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

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

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: 22 + 23

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											
N-Nitroso-di-n-propylamine ✓	157	152	ND	~~59.8~~ 90.9	80.9	59.8	59.8	53.2	53.2	11.6	11.6
4-Chloro-3-methylphenol											
Acenaphthene											
Pentachlorophenol ✓	227	228	ND	198	179	87.2	87.2	78.5	78.5	10.1	10.1
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 #: 15767A26
SDG #: J753

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

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

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

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: LCS-101706

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										
N-Nitroso-di-n-propylamine	156	NA	108	NA	69.2	69.2				
4-Chloro-3-methylphenol										
Acenaphthene										
Pentachlorophenol	156	NA	144	NA	92.3	92.3	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 #: 15767A2b
SDG #: JE53

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 6 of 7
Reviewer: 5
2nd reviewer: A

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

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. #4 . Dibenzo (a,h) Anthracene

Conc. = $\frac{(55521)(2)(2)(1000)(\quad)}{(365537)(1.1389)(33.1)(\quad)(\quad)}$

= 16 ug/kg

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

LDC #: 15767B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 11/14/06
SDG #: KA18 Level III 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: 10/4/06
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	A	
VIII.	Laboratory control samples /SRM	~~SW~~ A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentitatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks SW	ND	RB = 15

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

Validated Samples sediment + water

1	LDW-SS335-010 S		11	LDW-SS317-010 S		21	MB-101806	31	
2	LDW-SS313-010		12	LDW-SS316-010		22	MB-101106	32	
3	LDW-SS314-010		13	LDW-SS315-010		23		33	
4	LDW-SS322-010		14	LDW-SS303-010		24		34	
5	LDW-SS323-010		15	LDW-SS325-RB W		25		35	
6	LDW-SS320-010		16	LDW-SS325-010 S		26		36	
7	LDW-SS319-010		17	LDW-SS326-010		27		37	
8	LDW-SS324-010		18	LDW-SS304-010		28		38	
9	LDW-SS321-010		19	LDW-SS316-010MS		29		39	
10	LDW-SS318-010		20	LDW-SS316-010MSD		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 #: 15767B26
SDG #: KA1B

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	~~10/26/06~~	~~CC1026~~	~~O~~	~~38.1~~		~~All water + MB 101106 (1)~~	~~J/UJ/A~~
	10/27/06	CC1027	KKK	35.9		~~1-12, 19~~ 1-8, 10-12	J/UJ/A
	~~10/25/06~~	~~ICV1025~~	~~QQQ~~	~~40.16~~		~~All water + MB 101106 (1)~~	
			O	37.12			
			CC	~~5.92~~			
			QQ	70.92			
	11/1/06	ICV1101	QQQ	29.24		20, 13 → 14, 16 → 18	J/UJ/A

CONCAL2S

LDC #: 15767B26
SDG #: KA18
METHOD: GC/MS BNA (EPA SW 846 Method 8270) S1M

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		3	FBP	39.9 (40-130)	NO QUAL
				( )	
		5	NBZ	32.8 (↓)	↓
				( )	
		7	FBP	38.8 (↓)	↓
				( )	
				( )	
		11	FBP	38.4 (40-130)	J/UJ/P QUAL ALL B/N
			NBZ	38.4 (↓)	↓
				( )	
		12	FBP	39.2 (↓)	NO QUAL
				( )	
		13	TPH	36.2 (↓)	↓
				( )	
		16	FBP	39.5 (↓)	↓
				( )	
		18	TPH	38.6 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

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

LDC #: 15767B26
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Y N N/A Were field blanks identified in this SDG?

Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/kg

Sampling date: 10/4/06

Field blank type: (circle one) Field Blank / Rinsate / Other: FB

1 → 14, 16 → 18 (ND)

Compound	Blank ID	Sample Identification								
	15									
Diethylphthalate										
Di-n-butylphthalate										
Bis(2-ethylhexyl)phthalate										
QQQ	3.0									
CRQL										

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 field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: 15720A3b

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/8/06

SDG #: JZ15

Page: 1 of 1

Laboratory: Analytical Resources, Inc.

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: 10/2/06
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
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	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	SW	D = 4 & 5 10 & 11
XV.	Field blanks	N	

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

Validated Samples:

Sediment

+ 1	LDW-SS330-010	+ 11	LDW-SS402-010	21	MB-101606	31	
+ 2	LDW-SS327-010	12	LDW-SS331-010MS	22		32	
+ 3	LDW-SS328-010	13	LDW-SS331-010MSD	23		33	
+ 4	LDW-SS329-010	14		24		34	
+ 5	LDW-SS401-010	15		25		35	
+ 6	LDW-SS331-010	16		26		36	
+ 7	LDW-SS332-010	17		27		37	
+ 8	LDW-SS334-010	18		28		38	
+ 9	LDW-SS333-010	19		29		39	
+ 10	LDW-SS337-010	20		30		40	

NO ICV

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 #: 15720A3b
SDG #: JZ15

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

METHOD: ✓ GC __ HPLC

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

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
(Y) N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y (N) N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	12 + 13	BB	0 (50-150)	( )	( )	6	no QUAL
			( )	( )	( )		3x DIL
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 15710A36
SDG #: JZ15

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: ✓ GC __ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	%RPD Bet column Finding ≤40	Associated Samples	Qualifications
	BB	53%	6	J/A dit

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15720A36
SDG #: JZ15

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

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

Compound	Concentration (ug/kg) 4	5	≤ 50 RPD
Z	~~33~~ 33	36	9
AA	46	43	7
BB	45	43	5

Compound	Concentration (ug/kg) 10	11	RPD
AA	20	16	22
BB	20	18	11

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 15767A3b

VALIDATION COMPLETENESS WORKSHEET

Level IV

Date: 10/14/06

SDG #: JZ53

Page: 1 of 1

Laboratory: Analytical Resources, Inc.

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: 10/3/06
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration	A	ICV ≤ 15
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	
Xa.	Florisil cartridge check	N	Sulfur + Acid clean up performed on all sediments
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	SW	Internal standard Acceptable
XIV.	Field duplicates	SW	~~SW~~ D = 10 & 21
XV.	Field blanks	ND	RB = 1 + 16

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 + Water

1	LDW-SS344-RB W	11	LDW-SS302-010 S	21	LDW-SS403-010 S	31 1	MB-101806
2	LDW-SS344-010 S	12	LDW-SS305-010	22	LDW-SS308-010MS	32 2	MB-101006
3	LDW-SS342-010	13	LDW-SS307-010	23	LDW-SS308-010MSD	33	
4	LDW-SS343-010	14	LDW-SS306-010	24	LDW-SS312-010D	34	
5	LDW-SS341-010	15	LDW-SS308-010	25	~~LDW-SS~~	35	
6	LDW-SS339-010	16 2	LDW-SS308-RB W	26		36	
7	LDW-SS340-010	17	LDW-SS309-010 S	27		37	
8	LDW-SS338-010	18	LDW-SS310-010	28		38	
9	LDW-SS336-010	19	LDW-SS311-010	29		39	
10	LDW-SS301-010	20	LDW-SS312-010	30		40	

LDC #: 15767A36
SDG #: J753

VALIDATION FINDINGS CHECKLIST

Reviewer: EB
2nd Reviewer: C

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?	NA	✓		
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 #: 15767A36
SDG #: J253

VALIDATION FINDINGS CHECKLIST

Reviewer: FD
2nd Reviewer: dc

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 (EPA SW 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 #: 15767A36
SDG #: JZ53

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: EZ
2nd Reviewer: d

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
	12	ZB35	DCB	159 (50-150)	J/P det
				( )	
				( )	
	16	↓	DCB	47.8 (↓)	J/UJ/P
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	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 #: 15767A36
SDG #: J253

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: B
2nd Reviewer: A

METHOD: ___ GC ___ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding (% RPD Bet column ≤ 40)	Associated Samples	Qualifications
	BB	45%	7	J/A det

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15767A36
SDG #: J753

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: B
2nd Reviewer: C

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	exceeded cal Range	20	NA
	The laboratory has identified the Aroclors with the closest pattern match, but indicates the early PCB pattern is most likely a mixture.			Text

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15767A36
SDG #: JZ53

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	exceeded cal Range	20	R/A
	all except above	diluted	24	R/A

Comments: _____

LDC #: 15767A36
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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 ≤ 50	Qualification Parent only / All Samples
	10	21		
Aroclor 1248 (Z)	32	304	NC ~~200~~	
↓ 1254 (AA)	38	49	25	
↓ 1260 (BB)	38	46	19	

Compound	Concentration ( )		%RPD Limit _____	Qualification Parent only / All Samples

LDC #: 15767A36
SDG #: J253

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: A

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 (250 std)	Recalculated CF (250 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/19/06	Aroclor 1260-1 ZB5	0.1505	0.1505	0.1513	0.1513	6.1	6.1
			Aroclor 1260-1 ZB35	0.1051	0.1051	0.1094	0.1094	10.0	10.0
2									
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 #: 15767A36
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: F
2nd Reviewer: L

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	10/20/06 1841	Aroclor 1260-1 (ZB5)	250.0	254.8	254.8	1.9	1.9
			(ZB35)	↓	251.1	251.1	0.4	0.4
2	CCV	10/21/06 1952	↓	250.0	235.1	235.1	6.0	6.0
			↓	↓	247.5	247.5	1.0	1.0
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 #: 15767A36
SDG #: JZ53

METHOD: ~~GC~~ __ HPLC

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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: #2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
	ZB-35			Reported	Recalculated	
DCB	not ~~specified~~	40.0	31.0	77.5	77.5	0
TCMX	↓	↓	26.8	67.0	67.0	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 #: 15767A36
SDG #: J3553

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 sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 22 + 23

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	183	188	104	252	300	80.9	80.9	104	104	17.4	17.4

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 #: 15767A36
SDG #: JZ53

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

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

METHOD: ~~GC~~ HPLC

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

% Recovery = 100* (SSC-SC)/SA
RPD = I LCS - LCSD I * 2/(LCS + LCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	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	14.2	NA	20.0	NA	71.0	71.0	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 #: 15767A3D
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

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

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. # 2 Compound Name Aroclor 1254

Concentration = $\frac{126.2 \times 1}{25.5}$

= 4.95 ug/kg

#	Sample ID	Compound	Reported Concentrations	Recalculated Results Concentrations	Qualifications
	Aroclor 1254-1=	$\frac{2139949}{26396230} \times 80 \times 0.05969$	= 108.66		
	Aroclor 1254 = (1+2+3+4+5)/5	= 108.7 +	$\frac{142.4 + 108.6 + 121.5 + 149.9}{5}$	= 126.2	

Comments: _____

SAMPCALew.wpd

LDC #: 15767B3b

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/14/06

SDG #: KA18

Page: 1 of 1

Laboratory: Analytical Resources, Inc.

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: 10/4/06
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration	A	ICV ≤ 15
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	N	
Xb.	GPC Calibration	N	Sulfur + Acid clean up performed on all sediments
XI.	Target compound identification	~~STR~~ A	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	SW	
XIV.	Field duplicates	N	
XV.	Field blanks	NP	RB = 20

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 and water

1	LDW-SS335-010	S	11	LDW-SS318-010	S	21	LDW-SS325-010	S	31	MB - 101806	
2	LDW-SS335-010DL		12	LDW-SS317-010		22	LDW-SS325-010DL		32	MB - 101106	
3	LDW-SS313-010		13	LDW-SS317-010DL		23	LDW-SS326-010		33		
4	LDW-SS314-010		14	LDW-SS316-010		24	LDW-SS326-010DL		34		
5	LDW-SS322-010		15	LDW-SS316-010DL		25	LDW-SS304-010		35		
6	LDW-SS323-010		16	LDW-SS315-010		26	LDW-SS304-010DL		36		
7	LDW-SS320-010		17	LDW-SS315-010DL		27	LDW-SS304-010MS		37		
8	LDW-SS319-010		18	LDW-SS303-010		28	LDW-SS304-010MSD		38		
9	LDW-SS324-010		19	LDW-SS303-010DL		29			39		
10	LDW-SS321-010		20	LDW-SS325-RB	W	30			40		

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 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 #: 15767B35
SDG #: KA18

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Reviewer: B
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	not specified	DCB	192 (50 - 150)	J/P dil
				( )	
				( )	
	15	↓	DCB	152 (↓)	NO QUAL 5X DIL
			1	( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	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 #: 15767B3b
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

METHOD: ~~GC~~ __ HPLC

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

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

(Y) N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

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

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	27 + 28	Y	0 (50-150)	0 (50-150)	( )	25, 26	no QUAL
		BB	0 (↓)	0 (↓)	( )	↓	5x DIL
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		

LDC #: 15767B35
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: EZ
2nd Reviewer:

METHOD: ~~GC~~ __ HPLC

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

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

#	Compound Name	Sample ID	~~RD~~ Between Two Columns/Detectors % RPD Limit (≤ 40%)	Qualifications
	Z	3	51	J/A all
	BB	7	43	
	BB	10	68	
	BB	11	51	
				Z
	Z	12	62	N/A
	AA	↓	62	
	Z	16	57	
	AA	↓	53	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15767B35
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

METHOD: ~~GC~~ __ HPLC

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

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

#	Compound Name	Sample ID	~~RPD~~ Between Two Columns/Detectors % RPD Limit (≤ 40%)	Qualifications
	Z	21	68	N/A detn
	AA	↓	61	↓
	AA	25	42	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15767B36
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer:
2nd Reviewer:

METHOD: ✓ GC ___ HPLC

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

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Z, AA, BB	exceeded cal Range	1, 12, 16, 21, 23	~~J/A etc~~ NA
	AA, BB	↓	14, 18, 25	↓
	The laboratory noted ~~that~~ the aroclor patterns sometimes best matched with Aroclor 1242, but other times with Aroclor 1248, and is most likely a mixture of the two Aroclors.			Text

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15767B36
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Reviewer:
2nd Reviewer:

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
	Z, AA, BB	exceeded cal Range	1, 12, 16, 21, 23	R/A
	All except above	diluted	2, 13, 17, 22, 24	R/A
	AA, BB	exceeded cal Range	14, 18, 25	R/A
	All except above	diluted	15, 19, 26	R/A

Comments: _____

LDC #: 15767A19 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/14/06
SDG #: JZ53 Level IV Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: FT
2nd Reviewer: AC

METHOD: GC/MS Butyltins (Krone) / 8270D

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: 10/3/06
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration	A	
V.	Blanks	A	
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	A	
XIII.	Tentitatively identified compounds (TICs)	N	not reported
XIV.	System performance	A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW ~~ND~~	D = 2 & 6
XVII.	Field blanks	ND	RB = 1, 4

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: Water & sediment

1 1	LDW-SS344-RB W	11 1	MB-101006	21		31	
2 2	LDW-SS301-010 S	12 2	MB-101706	22		32	
3	LDW-SS302-010	13		23		33	
4 1	LDW-SS308-RB	14		24		34	
5	LDW-SS310-010	15		25		35	
6	LDW-SS403-010	16		26		36	
7	LDW-SS403-010MS	17		27		37	
8	LDW-SS403-010MSD	18		28		38	
9		19		29		39	
10		20		30		40	

~~NO TCV~~

LDC #: 15767A19
SDG #: JZ53

VALIDATION FINDINGS CHECKLIST

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

Butyltins (krone)

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 #: 15767A19
SDG #: J753

VALIDATION FINDINGS CHECKLIST

Reviewer:
2nd Reviewer:

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 #: 15767A19
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [illegible]
2nd reviewer:

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

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

Compound	Concentration (ug/kg)		≤ 50 RPD
	2	6	
Tributyl Tin ion	17	14	19
Dibutyl Tin ion	6.9	5.7U	~~20~~ NC

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 15767A19
SDG #: JZ53

Butyltins (Krone)

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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

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

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

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

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (1/2 std)	Recalculated RRF (1/2 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	8/30/06	~~Phenol~~ (1st internal standard) Tributyl Tin Hexyl	0.603	0.603	0.607	0.607	3.1	3.1
			Naphthalene (2nd internal standard) Butyl Tin Hexyl	0.048	0.048	0.050	0.050	3.0	3.0
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			~~Benzo(a)pyrene~~ (6th internal standard)						
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

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

LDC #: 15767A19
SDG #: JZ53

Butyltins (Krone)

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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	10/17/06	~~Tributyl tin Hexyl~~ Phenol (1st internal standard)	0.607	0.677	0.677	11.5	11.5
			~~Butyl tin Hexyl~~ Naphthalene (2nd internal standard)	0.050	0.053	0.053	6.0	6.0
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2	CCV	10/19/06	~~Tributyl tin Hexyl~~ Phenol (1st internal standard)	↓	0.639	0.639	5.3	5.3
			~~Butyl tin Hexyl~~ Naphthalene (2nd internal standard)	↓	0.032	0.032	3.2	3.2
			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 #: 15767A19
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

METHOD: GC/MS ~~Semivolatiles (EPA SW-846 Method 8270)~~ Butyltins (Krone)

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: 2

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ Tripropyl Tin chloride	47.23	32.37 X 0.8588	58.4	58.4	0
2-Fluorobiphenyl Tripentyl Tin chloride	↓	41.22 X 0.8809	76.8	76.8	0
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					

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 #: 15767A19
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

Butyltins (krone)

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

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

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

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

MS/MSD samples: 7+8

Compound	Spike Added (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 ion	44.0	44.1	13-5	51.4	60.1	86.1	86.1	106	106	15-6	15-6
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 #: 15767A19
SDG #: JZ53

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

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

Butyltins (Krone)

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: LCS – 101706

Compound	Spike Added ( )		Spike Concentration ( )		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Tributyl Tin Phenol ion	44.6	NA	40.8	NA	91.5	91.5	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 #: 157619 **VALIDATION FINDINGS WORKSHEET** Page: 1 of 1
SDG #: JZ53 **Sample Calculation Verification** Reviewer: [illegible]
Butyltins (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?

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. #2 . Tributyl Tin Ion

Conc. = $\frac{(\text{~~27149~~}\ 15036)(2)(0.5)(1000)(0.8675)(.891)}{(213877)(0.607)(5.29)(\ )(\ )}$ = 16.9 ng/Kg

(to chloride; To Ion)

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

LDC #: 15720A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/8/06
SDG #: JZ15 Level III Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 200.8/EPA SW 846 Method 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: 10/2-10/6
II.	Calibration	A	
III.	Blanks	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	SRM
VIII.	Internal Standard (ICP-MS)	A	
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(4, 5) (10, 11)
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-SS330-010	11 D	LDW-SS402-010	21		31	
2	LDW-SS327-010	12	LDW-SS330-010MS	22		32	
3	LDW-SS328-010	13	LDW-SS330-010DUP	23		33	
4	LDW-SS329-010	14	FB	24		34	
5	LDW-SS401-010	15		25		35	
6	LDW-SS331-010	16		26		36	
7	LDW-SS332-010	17		27		37	
8	LDW-SS334-010	18		28		38	
9	LDW-SS333-010	19		29		39	
10 D	LDW-SS337-010	20		30		40	

Notes:

LDC #: 15920A4
SDG #: J215

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)
1-1	sediment	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
1-2,13	↓	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, 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 #: 15720A4
SDG #: J215

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	12	Solid	Sb	1.9	All	J/UJ/A (post spike 98.7 %)
			Ag	36.4	+13	93.7 %)

Comments:

MS.4S2

LDC#: 15720A4
SDG#: J215

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: V
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 200.8/7000)

(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 (mg/kg)		(≤30) RPD	
	4	5		
Arsenic	8.4	8.9	6	
Chromium	26.5	38.8	38	
Cobalt	6.1	6.4	5	
Copper	62..9	41.9	39	
Lead	303	44	149	
Mercury	0.06	0.10	50	
Nickel	18.9	16.9	11	
Vanadium	39.0	41.1	5	
Zinc	75	74	1	
Molybdenum	0.5	0.6	18	

LDC#: 15720A4
SDG#: J215

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: Metals (EPA Method 200.8/7000)

(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 (mg/kg)		(≤30) RPD	
	10	11		
Arsenic	8.8	8.5	3	
Chromium	23	23	0	
Cobalt	7.5	7.2	4	
Copper	30.5	29.6	3	
Lead	14	13	7	
Mercury	0.11	0.11	0	
Nickel	18.9	17.9	5	
Silver	0.9	0.3U	NC	
Vanadium	50.6	48.3	5	
Zinc	85	72	17	
Molybdenum	0.4	0.3U	NC	

LDC #: 15767A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/13/06
SDG #: JZ53 Level IV Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: WH
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 200.8/EPA SW 846 Method 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: 10/3/06
II.	Calibration	A	
III.	Blanks	A	
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, SRM
VIII.	Internal Standard (ICP-MS)	A	reviewed for All
IX.	Furnace Atomic Absorption QC	N	
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	A	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(16, 21)
XIV.	Field Blanks	SW	RB = 1, 16

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-SS344-RB~~	11	LDW-SS302-010	21	LDW-SS403-010	31	
2	LDW-SS344-010	12	LDW-SS305-010	22	~~LDW-SS344-RBMS~~	32	
3	LDW-SS342-010	13	LDW-SS307-010	23	~~LDW-SS344-RBDUP~~	33	
4	LDW-SS343-010	14	LDW-SS306-010	24	LDW-SS344-010MS	34	
5	LDW-SS341-010	15	LDW-SS308-010	25	LDW-SS344-010DUP	35	
6	LDW-SS339-010	16	~~LDW-SS308-RB~~	26	PB	36	
7	LDW-SS340-010	17	LDW-SS309-010	27		37	
8	LDW-SS338-010	18	LDW-SS310-010	28		38	
9	LDW-SS336-010	19	LDW-SS311-010	29		39	
10	LDW-SS301-010	20	LDW-SS312-010	30		40	

Notes: _____

LDC #: 15767A4
SDG #: J2F3

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer: M

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?	✓			
V. 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.	✓			
VI. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			
VII. 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 #: 15767A4
SDG #: J233

VALIDATION FINDINGS CHECKLIST

Page: 2 of 4
Reviewer: MM
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X (100X) the IDL?	✓			
Were all percent differences (%Ds) < 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
VIII. Internal Standards (EPA SW-846 Method 6020)				
Were all the percent recoveries (%R) within the ~~30-120%~~ 60-125% of the intensity of the internal standard in the associated initial calibration?	✓	✓		
If the %Rs were outside the criteria, was a reanalysis performed?	✓		NA	
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 #: 15767A4
SDG #: [illegible]

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
2-15, 19-21	Sed...	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
22-24, 25	Water	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, 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 #: 15967A4
SDG #: J713

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

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

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125~~ 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	24	Solid	Sb	3.4	All + 25	J/UJ/A (post spike 99.7%)

Comments:

LDC#: 15767A4
SDG#: J743

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: Metals (EPA Method 200.8/7000)

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 (mg/kg)		(≤30) RPD	
	1	2		
Arsenic	7.8	7.6	3	
Chromium	15.8	17.8	12	
Cobalt	4.9	5.0	2	
Copper	34.5	35.9	4	
Lead	27	25	8	
Mercury	0.91	0.16	140	
Nickel	10.9	11.9	9	
Vanadium	37.4	40.6	8	
Zinc	106	74	36	
Molybdenum	0.5	0.5	0	

LDC #: 15767A4
SDG #: J7Z3

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Sample: 1 Field Blank / Trip Blank / Rinsate / Other RB (circle one)

Analyte	Concentration Units (ug/L)
Cu	0.6

Sample: 16 Field Blank / Trip Blank / Rinsate / Other RB (circle one)

Analyte	Concentration Units (ug/L)
Cu	1.5

LDC #: 5767A4
SDG #: J213

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recaluculated using the following formula:

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

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

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

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

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Ag	18.676	20	93.4	93.5	Y
LCS	Laboratory control sample	Ni	24.96	25	100	100	↓
24	Matrix spike	Zn	(SSR-SR) 91.3	104	87.8	87.5	
24	Duplicate	Cr	11.8	13.1	10.4	10.4	
1	ICP serial dilution	V	32.93	30.047	9.6	9.7	↓

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 #: 15967A4
SDG #: JZ53

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer: AL

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

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

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP (Initial calibration) MG	Sb	48.95	50	97.9	97.9	Y
	GFAA (Initial calibration)						
ICV	CVAA (Initial calibration)	Hg	8.07	8.0	100.9	100.9	Y
CCV	ICP (Continuing calibration)	Pb	51.89	50	103.9	103.8	Y
	GFAA (Continuing calibration)						
CCV	CVAA (Continuing calibration)	Hg	4.35	4.0	108.8	108.8	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 #: 15967A4
SDG #: JT253

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

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

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for 2, 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:

$$Co = \frac{5.035\ ug/L \times 0.05L \times 20}{0.719 \times 1.0689g} = 6.56\ mg/kg$$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
2	Ag	6.0	6.0	Y
	Cr	13.1	13.1	
	Co	6.6	6.6	
	Cu	16.2	16.2	
	Pb	6	6	
	Mo	0.3	0.3	
	Ni	14.5	14.5	
	V	39.1	39.1	
	Zn	57	57	
11	Ag	15.2	15.2	
	Cd	0.5	0.5	
	Cr	33	33	
	Co	8.6	8.5	
	Cu	84	84	
	Pb	63	63	
	Hg	0.59	0.59	
	Mo	1.0	1.0	
	Ni	23	23	
	Ag	0.5	0.5	
	V	64.0	64.0	
	Zn	151	151	✓

LDC #: 15767B4

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/13/06

SDG #: KA18

Page: 1 of 1

Laboratory: Analytical Resources, Inc.

Reviewer:

2nd Reviewer:

METHOD: Metals (EPA Method 200.8/EPA SW 846 Method 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: 10/4/06
II.	Calibration	A	
III.	Blanks	A	
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, SRM
VIII.	Internal Standard (ICP-MS)	A	
IX.	Furnace Atomic Absorption QC	N	Not utilized.
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	SW	RB = 15

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

Validated Samples: Soil only

1	LDW-SS335-010	11	LDW-SS317-010	21	RB	31	
2	LDW-SS313-010	12	LDW-SS316-010	22		32	
3	LDW-SS314-010	13	LDW-SS315-010	23		33	
4	LDW-SS322-010	14	LDW-SS303-010	24		34	
5	LDW-SS323-010	15	~~LDW-SS325-RB~~	25		35	
6	LDW-SS320-010	16	LDW-SS325-010	26		36	
7	LDW-SS319-010	17	LDW-SS326-010	27		37	
8	LDW-SS324-010	18	LDW-SS304-010	28		38	
9	LDW-SS321-010	19	LDW-SS335-010MS	29		39	
10	LDW-SS318-010	20	LDW-SS335-010DUP	30		40	

Notes:

LDC #: 15767B4
SDG #: KA18

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)
L14, 16-18	Sediment	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
L19, 20		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN^-, ___ ___
		Al, Sb, As, 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 #: 137684
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Reviewer: MM
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 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	19	Sediment	Sb	2.5	All +20	J/UJ/A (post spike: 102.9)
			Ag	17.6	↓	↓ (↓ 99.1

Comments: _____

MS.4S2

LDC #: 67678Y
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: MH
2nd reviewer: 4

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Sample: 15 Field Blank / Trip Blank / Rinsate / Other RB (circle one)

Analyte	Concentration Units (ug/L)
Cu	2.2
Zn	U

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Analyte	Concentration Units ( )

LDC #: 15720A6
SDG #: JZ15
Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 11/8/06
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Grain Size (PSEP), 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: 10/1-2/06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	
V	Duplicates	A	Triplicate
VI.	Laboratory control samples	A	LCS, SRM
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(4, 5), (10, 11)
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-SS330-010	11	LDW-SS402-010	21		31	
2	LDW-SS327-010	12	LDW-SS330-010MS	22		32	
3	LDW-SS328-010	13	LDW-SS330-010DUP	23		33	
4	LDW-SS329-010	14	LDW-SS337-010DUP	24		34	
5	LDW-SS401-010	15	LDW-SS337-010TRP	25		35	
6	LDW-SS331-010	16	LDW-SS330-010TRP	26		36	
7	LDW-SS332-010	17	MB	27		37	
8	LDW-SS334-010	18		28		38	
9	LDW-SS333-010	19		29		39	
10	LDW-SS337-010	20		30		40	

Notes:

LDC #: 15730A6
SDG #: 27K

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MY
2nd reviewer: H

All circled methods are applicable to each sample.

Sample ID	Parameter
1-11	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (TS) (Grain Size) ____ ____
~ 11, 12, 13	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} ____ ____ ____ ____
↓ 13, 14, 15	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ (Grain Size) ____ ____
↓ 17, 16	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+}

Comments:

LDC#: 15720A6
SDG#: JF15

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics, Method Cat Conv

(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	
	4	5		
TS	70.30	68.80	2 (≤20)	
TOC	0.972	1.59	48 (≤30)	

Analyte	Concentration (%)		RPD	
	10	11		
TS	55.80	56.10	1 (≤20)	
TOC	2.20	2.16	2 (≤30)	

LDC#: 15720A6 SDG#: J215

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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?

Phi Size	Percent Finer Than Indicated Size		(≤30) RPD	
	4	5		
Gravel (-2)	100	99.4	1	
Gravel (-1)	98.4	97.8	1	
Very Coarse Sand (0)	96.5	96.3	0	
Coarse Sand (1)	86.1	86.1	0	
Medium Sand (2)	71.8	46.2	43	
Fine Sand (3)	46.2	34.5	29	
Very Fine Sand (4)	26.5	26.2	1	
Silt (5)	22.1	21.5	3	
Silt (6)	17.0	16.7	2	
Silt (7)	11.4	11.4	0	
Silt (8)	7.8	7.8	0	
Clay (9)	5.3	5.4	2	
Clay (10)	3.5	3.6	3	

LDC#: 15990 A6
SDG#: JJ715

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?

Phi Size	Percent Finer Than Indicated Size		(≤30) RPD	
	10	11		
Gravel (-2)	99.8	100	0	
Gravel (-1)	99.8	99.8	0	
Very Coarse Sand (0)	98.9	99.2	0	
Coarse Sand (1)	97.5	97.7	0	
Medium Sand (2)	94.9	94.9	0	
Fine Sand (3)	70.9	71.3	1	
Very Fine Sand (4)	46.7	46.4	1	
Silt (5)	32.7	30.8	6	
Silt (6)	21.0	19.9	5	
Silt (7)	13.0	12.5	4	
Silt (8)	8.2	8.1	1	
Clay (9)	6.0	5.9	2	
Clay (10)	4.3	4.2	2	

LDC #: 15767A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/13/06
SDG #: JZ53 Level IV Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: W
2nd Reviewer: E

METHOD: Grain Size (PSEP), 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: 10/3/06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	MS
V	Duplicates	A	Triplicate
VI.	Laboratory control samples	A	LCS / SRM
VII.	Sample result verification	A	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(10, 21)
X	Field blanks	ND	RB21, 16

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-SS344-RB~~	11	LDW-SS302-010	21	LDW-SS403-010	31	
2	LDW-SS344-010	12	LDW-SS305-010	22	~~LDW-SS344-RBMS~~	32	
3	LDW-SS342-010	13	LDW-SS307-010	23	~~LDW-SS344-RBDUP~~	33	
4	LDW-SS343-010	14	LDW-SS306-010	24	LDW-SS306-010DUP	34	
5	LDW-SS341-010	15	LDW-SS308-010	25	LDW-SS306-010TRP	35	
6	LDW-SS339-010	16	~~LDW-SS308-RB~~	26	LDW-SS308-010MS	36	
7	LDW-SS340-010	17	LDW-SS309-010	27	LDW-SS308-010DUP	37	
8	LDW-SS338-010	18	LDW-SS310-010	28	✓ TRP	38	
9	LDW-SS336-010	19	LDW-SS311-010	29	MB	39	
10	LDW-SS301-010	20	LDW-SS312-010	30		40	

Notes:

LDC #: 15767A6
SDG #: J2253

VALIDATION FINDINGS CHECKLIST

Reviewer: MH
2nd Reviewer: AD

Method: Inorganics (EPA Method See cover

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 #: 51967A6
SDG #: J353

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer: A

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 #: 15767A6
SDG #: J773

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MY
2nd reviewer: t

All circled methods are applicable to each sample.

Sample ID	Parameter
2-15, 19-21	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} (TS) (Grain size) ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
24, 25	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ (Grain size) ____ ____
✓26, 27, 28	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN (TOC) CR^{6+} ____ ____ ____ ____
✓27, 28	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+}

Comments:

LDC#: 15767A6
SDG#: J2K3

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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	
	10	21		
Total Solids	67.50	66.80	1	(≤20)
TOC	1.55	1.95	23	(≤30)

V:\FIELD DUPLICATES\FD_inorganic\15767A6.wpd

LDC#: 15767A6
SDG#: T233

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: VL
2nd Reviewer: A

Grain Size, Method PSEP

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

Phi Size	% Finer (%)		(≤30) RPD	
	10	21		
-2	97.1	98.0	1	
-1	91.4	92.8	2	
0	87.7	88.8	1	
1	78.1	79.1	1	
2	41.2	41.6	1	
3	22.4	21.9	2	
4	18.2	17.8	2	
5	15.6	14.8	5	
6	12.2	11.7	4	
7	8.6	8.3	4	
8	6.0	5.7	5	
9	4.2	4.0	5	
10	2.7	2.5	8	

LDC #: 15767A6
SDG #: J7d3

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

METHOD: Inorganics, Method See cover

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

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

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

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	TOC	0.501	0.500	100.2	100.2	Y
26	Matrix spike sample	TOC	(SSR-SR) 1.43	1.76	81.2	81.1	
27,28	Duplicate sample	TS	523,531	527.4	RSD 0.8	RSD 0.8	

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

TOTCLC.6

LDC #: 13967 A6
SDG #: J853

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

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

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:

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

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte		_____(units)	_____ (units)	Recalculated r or %R	Reported r or %R	Acceptable (Y/N)
Initial calibration	TOC NA	Blank					
Calibration verification		Standard 1					
		Standard 2					
		Standard 3					
		Standard 4					
		Standard 5					
		Standard 6					
		Standard 7					
Calibration verification 10/6/16 CCV	TOC	5000	4875		97.5	97.5	Y
Calibration verification 10/11/16 CCV	TOC	5000	5133		102.7	102.7	Y
Calibration verification							

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

LDC #: 15767A6
SDG #: TE43

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 2 of 2
Reviewer: MH
2nd reviewer: ↑

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

Concentration =

Recalculation:

$$TS = \frac{(3.7663 - 1.0154) \times 100\ \%}{6.5555} = 49.65\%$$

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
1	11	TS (%)	49.70	49.7	Y
		TOC ↓	2.32	2.32	↓
		Phi Size	% Trimer	% Trimer	
		-2	99.2	99.2	Y
		-1	98.4	98.4	
		0	96.5	96.5	
		1	94.2	94.2	
		2	81.4	81.4	
		3	65.1	65.1	
		4	57.2	57.2	
		5	52.0	51.9	
		6	37.8	37.6	
		7	23.6	23.3	
		8	13.5	13.4	
		9	12.9	12.5	
		10	8.6	8.1	✓

Note:

LDC #: 15767 A6
SDG #: TB53

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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 2 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

#2 TOC = $\frac{13445\ mg/kg \times 95.29}{92.9} = 13882\ mg/kg$

$= 1.388\%$

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)
1	2	TS (%)	92.90	92.9	Y
		TOC ✓	1.39	1.39	✓
			% Fines	% Fines	
		Phi Size -1	99.91	99.1	Y
		0	82.44	82.4	
		1	40.99	40.9	
		2	24.99	24.9	
		3	18.11	18.1	
		4	10.66	10.6	
		5	6.90	6.9	
		6	4.88	4.8	
		7	3.22	3.2	
		8	2.00	2.0	
		9	1.44	1.4	
		10	0.99	0.9	✓

Note:

LDC #: 15767B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/13/06
SDG #: KA18 Level III Page: 1 of 1
Laboratory: Analytical Resources, Inc. Reviewer: W
2nd Reviewer: A

METHOD: Grain Size (PSEP), 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: 10/4/06
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	MS
V	Duplicates	A	Triplicate
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-SS335-010	11	LDW-SS317-010	21	LDW-SS316-010TRP	31	
2	LDW-SS313-010	12	LDW-SS316-010	22	LDW-SS335-10TRP	32	
3	LDW-SS314-010	13	LDW-SS315-010	23	MB	33	
4	LDW-SS322-010	14	LDW-SS303-010	24		34	
5	LDW-SS323-010	15	LDW-SS325-010	25		35	
6	LDW-SS320-010	16	LDW-SS326-010	26		36	
7	LDW-SS319-010	17	LDW-SS304-010	27		37	
8	LDW-SS324-010	18	LDW-SS335-010MS	28		38	
9	LDW-SS321-010	19	LDW-SS335-010DUP	29		39	
10	LDW-SS318-010	20	LDW-SS316-010DUP	30		40	

Notes:

LDC #: 15767B6
SDG #: KA18

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: MY
2nd reviewer: d

All circled methods are applicable to each sample.

Sample ID	Parameter
1-17	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [circled] CR^{6+} TS [circled] Grain Size [circled] ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
rV 18, 19, 22	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC [circled] CR^{6+} ____ ____ ____ ____
19, 22	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} TS [circled] ____ ____ ____
20, 21	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ Grain Size [circled] ____ ____
	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 #: 15896A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/14/06
SDG #: DPWG20754/WG20336 Level IV Page: 1 of 1
Laboratory: AXYS Analytical Services Ltd. Reviewer: 9
2nd Reviewer: WN

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: 10/4/6
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	%RSD ≤ 20/30
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	SW	
XII.	System performance	A	
XIII.	Overall assessment of data	SW	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

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

Validated Samples:
MSeds

1	LDW-SS318-010	11	WG20336-101	21		31	
2	LDW-SS321-010	12		22		32	
3	LDW-SS322-010	13		23		33	
4	LDW-SS323-010	14		24		34	
5	LDW-SS324-010	15		25		35	
6	LDW-SS323-010DUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 15896A21
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

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

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

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% 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 #: 15096A2
SDG #: DPWG20704

VALIDATION FINDINGS CHECKLIST

Reviewer: 4
2nd Reviewer: MM

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 $\geq$ 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 $\geq$ 2.5?			✓	
Does the maximum intensity of each specified characteristic ion coincide within $\pm$ 2 seconds (includes labeled standards)?			✓	
For PCDF identification, was any signal (S/N $\geq$ 2.5, at $\pm$ 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.		✓		

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~~) 1613B)

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 #: 15896A1
SDG #: DDNF30754

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: T
2nd Reviewer: MM

METHOD: GC/MS Dioxins/Dibenzofurans (EPA ~~SW-846~~ Method ~~8280~~) 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 performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was method blank contamination less < CRQL for all target compounds?
Y N N/A Was the contaminant peak signal < 2% of the associated internal standard?

Blank extraction date: 10/18/06 **Blank analysis date:** 10/24/06
Conc. units: ng/kg
Associated samples: All

Compound	Blank ID	Sample Identification								
WF-9336-101		All > 5X								
F	0.05T									
G	0.069									
J	0.05U									
Q	0.057									
U	0.057									

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 #: 16896A2
SDG #: [illegible]

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

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

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 ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		all	Zero results (K flag)	all	U

Comments: See sample calculation verification worksheet for recalculations

LDC #: 15896B2
SDG #: DPW620TC4

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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

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 OB-5	All	R / A

Comments: _____

LDC #: 15896A2
SDG #: DPW620754

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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

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 = $(A_x)(C_s)/(A_s)(C_x)$
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_s = Area of associated internal standard
C_s = 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	10/13/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.21	1.21	1.22	1.22	2.58	2.77
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.00	1.00	0.95	0.95	4.49	4.43
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.92	0.92	0.93	0.93	3.60	3.61
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.06	1.06	1.09	1.09	3.46	3.36
			OCDF (^{13}C-OCDD)	1.54	1.54	1.55	1.55	6.09	5.90
2	ICAL	10/10/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.91	0.91	0.90	0.90	5.12	5.11
			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			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 #: 15896A21
SDG #: DPWF20TS4

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: 9
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~~ Conc (CC)	Recalculated ~~RRF~~ Conc (CC)	Reported %D	Recalculated %D
1	DX624198 S:1	10/27/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.21	10.2	10.2	Not calculated	
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.00	10.8	10.8		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.92	48.9	49.0		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.06	49.6	49.6		
			OCDF (^{13}C-OCDD)	1.54	96.2	96.4		
2	DB63_221 S:2	10/24/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.91	10.0	10.0		
			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 #: 15896A21
SDG #: DPNG20754

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: 9
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 = $(A_x)(C_s)/(A_s)(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_s = Area of associated internal standard
C_x = Concentration of compound, C_s = 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	DX62.415	10/24/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.21	10.2	10.2	Not reported	
	S=1		2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.00	10.5	10.5		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.92	50.4	50.4		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.06	49.1	49.2		
			OCDF (^{13}C-OCDD)	1.54	95.3	95.4		
2	DX62.418B	10/27/06	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.21	10.2	10.2		
	S=2		2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.00	10.6	10.6		
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.92	51.0	51.1		
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	1.06	49.6	49.6		
			OCDF (^{13}C-OCDD)	1.54	95.5	95.7		
3	DB63.223		2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.91	10.2	10.2		
	S=3		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 #: 15896B21
SDG #: WG20754

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

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

METHOD: GC/MS 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 = Laboraotry control sample percent recovery   LCSD = Laboratory control sample duplicate percent recovery

LCS ID: WG20336-102

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		10.4		104	104				
1,2,3,7,8-PeCDD	50		47.8		95.5	95.5				
1,2,3,4,7,8-HxCDD	↓		49.5		98.9	98.9				
1,2,3,4,7,8,9-HpCDF	↓		49.7		99.4	99.4				
OCDF	100		98.1		98.1	98.1				

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_6F_{13}	PFK		[430.9728]	LOCK	C_8F_{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	$C_{12}{}^{35}Cl_8{}^{37}Cl_2O_2$	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	$C_{12}{}^{35}Cl_8{}^{37}Cl_2O$	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_6F_{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_8F_{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 #: 15896A21
SDG #: DPWG20754

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: LW

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, F:

Conc. = $\frac{(166(e+07))(2000)(\quad)}{(3.83e+07)(1.06)(11.0)(\quad)}$

= 296.0 ng/kg

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