Appendix D

Sediment Conventionals Laboratory Reports

Analytical Resources, Incorporated
Analytical Chemists and Consultants

July 18, 2005

William Gardiner
Weston Solutions
P.O. Box 216
Port Gamble, WA 98364

RE: Client Project: Columbia River
ARI Job No. IF72

Dear Bill:

Please find enclosed the original chain of custody documentation and the final report for samples from the project referenced above.

Nine sediment samples were received June 30th, 2005 in good condition at a cooler temperature of 4.8°C. No analyses was indicated on the COC and samples were analyzed for grainsize as labeled on the sample containers. On July 12th ARI was asked to complete TOC analysis on the remaining samples. Analysis was completed within recommended holding times with no problems or incidents of note.

An electronic copy of this package and supporting raw data will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Susan Dunnihoo
Client Service Manager
sue@arilabs.com
206/695-6207

Enclosures

cc: eFileRef IF72

SD/sdrd

IF72 4.8°C

WESTON SOLUTIONS

☐ 2433 Impala Drive • Carlsbad, CA 92008 • (760) 931-8081, FAX 931-1580
☐ 98 Main St., Ste. #428 • Tiburon, CA 94920 • (415) 435-1847, FAX 435-0479
☐ 1440 Broadway, Ste. 908 • Oakland, CA 94612 • (510) 808-0302, FAX 891-9710
☐ 152 Sunset View Lane • Sequim, WA 98382 • (360) 582-1758, FAX 582-1679
☒ 4729 NE View Drive • Port Gamble, WA 98364 • (360) 297-6903, FAX 297-6905

CHAIN OF CUSTODY

№ 10647

DATE 6/29/05 PAGE 1 OF 1

PROJECT NAME / SURVEY / PROJECT NUMBER: MCR - COLUMBIA RIVER

PROJECT MANAGER: BILL GARDINER

COMPANY: SEE ABOVE

ADDRESS: SEE ABOVE

PHONE/FAX: SEE ABOVE

SAMPLE I.D.	DATE	TIME	MATRIX	INITIALS	NUMBER & TYPE OF CONTAINERS	ANALYSIS/TEST REQUESTED					PRESERVED HOW/ COMMENTS	FOR WESTON USE ONLY: SAMPLE TEMP UPON RECEIPT	FOR WESTON USE ONLY: WESTON LAB ID
CD-6-02	6/05/05		SED	B6	1 BAG								
D6-04	↓		↓	↓	↓								
E-2													
CL-03													
C6-04													
D-3													
B4-00													
A-7													
D6-01													

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPPING:

Shipping VIA: Airbill No:

SAMPLE CONDITION UPON RECEIPT (FOR WESTON USE ONLY):

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: [signature]	Signature: [signature]	Signature	Signature	Signature	Signature
Firm: WESTON	Firm: ARI	Firm	Firm	Firm	Firm
Date/Time: 6/29/05 1000	Date/Time: 6/30/05 0930	Date/Time	Date/Time	Date/Time	Date/Time

WHITE – return to originator • YELLOW – lab • PINK – retained by originator

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Weston Solutions, Inc.	Project No.: IF72
Client Project: MCR – Columbia River	

Case Narrative

1. The samples were submitted for grain size analysis according to PSEP methodology.
2. The samples were mostly sands and gravels and not appropriate for the pipette portion of the analysis, therefore they were run on the sieve portion only.
3. These samples were batched with other samples from another project. A triplicate was run on one of the other samples and is reported here.
4. The data is provided in summary tables and plots.
5. There were no noted anomalies in the samples or methods on this project.

Approved by: Harold Berry Date: 7/11/05
Title: Geotechnical Division Manager

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

PROJECT:	Weston Solutions Inc.	Project No.:	MCR-Columbia River
ARI Triplicate Sample ID:	IF59A	Batch No.:	IF59
Client Triplicate Sample ID:	NA	Page:	1 of 1

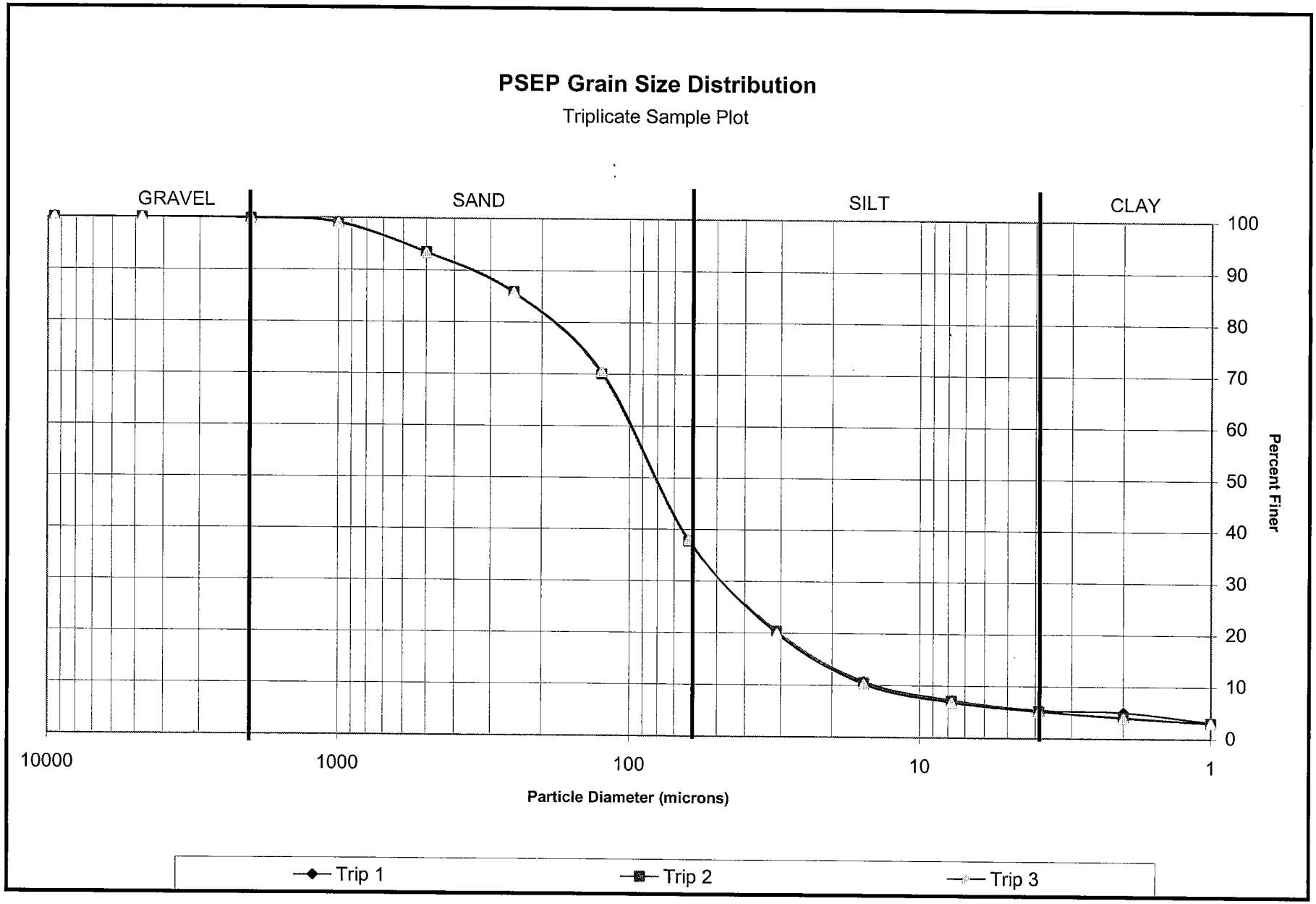
Relative Standard Deviation, By Phi Size

Sample ID	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
P48-REF39	100.0	100.0	100.0	99.2	93.4	85.7	70.1	37.8	20.2	10.7	7.2	5.4	5.1	3.2
P48-REF39	100.0	100.0	99.8	99.0	93.5	85.9	70.0	37.7	20.4	10.5	7.1	5.2	4.1	3.1
P48-REF39	100.0	100.0	99.8	99.0	93.4	85.7	70.5	38.0	19.9	10.2	6.8	5.1	4.0	3.0
AVE	NA	100.00	99.86	99.07	93.45	85.75	70.20	37.84	20.15	10.48	7.05	5.25	4.38	3.10
STDEV	NA	0.00	0.08	0.09	0.06	0.10	0.26	0.14	0.24	0.23	0.23	0.13	0.59	0.06
%RSD	NA	0.00	0.08	0.09	0.06	0.12	0.37	0.37	1.19	2.24	3.23	2.55	13.45	2.07

The Triplicate Applies To The Following Samples

Sample ID	Date Sampled	Date Extracted	Date Complete	QA Ratio (95-105)	Data Qualifiers	Pipette Portion (5.0-25.0g)
Trip 1	6/28/05	7/1/05	7/8/05	103.7		21.6
Trip 2	6/28/05	7/1/05	7/8/05	101.4		22.0
Trip 3	6/28/05	7/1/05	7/8/05	101.1		21.2
CD-6-02	6/5/05	7/1/05	7/8/05	NA		NA
D6-04	6/5/05	7/1/05	7/8/05	NA		NA
E-2	6/5/05	7/1/05	7/8/05	NA		NA
C6-03	6/5/05	7/1/05	7/8/05	NA		NA
C6-04	6/5/05	7/1/05	7/8/05	NA		NA
D-3	6/5/05	7/1/05	7/8/05	NA		NA
B4-00	6/5/05	7/1/05	7/8/05	NA		NA
A-7	6/5/05	7/1/05	7/8/05	NA		NA
D6-01	6/5/05	7/1/05	7/8/05	NA		NA
SG-10	6/5/05	7/1/05	7/8/05	NA		NA
SG-11	6/5/05	7/1/05	7/8/05	NA		NA
SG-12	6/5/05	7/1/05	7/8/05	NA		NA

ANALYTICAL RESOURCES INCORPORATED



Weston Solutions Inc.
MCR-Columbia River

Percent Finer Than Indicated Size

Sieve Size (microns)	2"	1"	3/4"	1/2"	3/8"	#4	#10 (2000)	#18 (1000)	#35 (500)	#60 (250)	#120 (125)	#230 (63)
CD-6-02	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.4	51.2	3.5	1.6
D6-04	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	96.6	14.6	3.3
E-2	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	99.4	96.7	28.1	10.0
C6-03	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.7	67.5	5.3	2.7
C6-04	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	98.4	48.4	2.8	1.1
D-3	100.0	100.0	100.0	100.0	100.0	99.7	99.6	99.4	99.0	96.6	20.2	8.0
B4-00	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.7	96.9	19.6	7.2
A-7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	97.4	16.3	6.1
D6-01	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.0	57.7	3.0	1.6

IF72

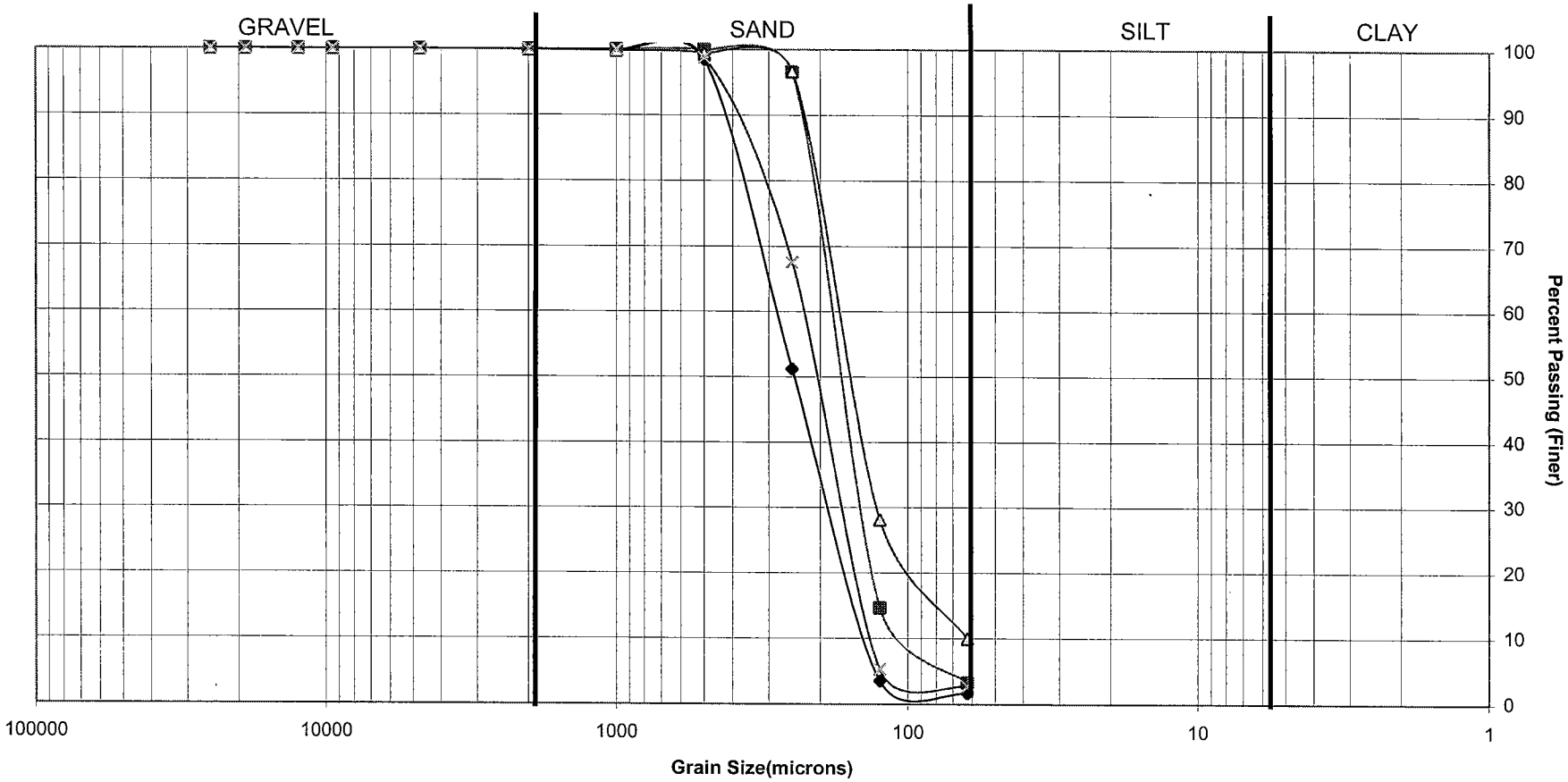
Weston Solutions Inc.
MCR-Columbia River

Percent Retained in Each Size Fraction

Sieve Size (microns)	>4750	4750-2000	2000-1000	1000-500	500-250	250-125	125-63	<63
CD-6-02	0.0	0.0	0.1	1.5	47.2	47.6	1.9	1.6
D6-04	0.0	0.0	0.0	0.1	3.4	81.9	11.4	3.3
E-2	0.0	0.1	0.1	0.4	2.7	68.6	18.1	10.0
C6-03	0.0	0.0	0.1	1.2	31.2	62.3	2.6	2.7
C6-04	0.0	0.1	0.1	1.4	50.0	45.6	1.7	1.1
D-3	0.3	0.1	0.2	0.3	2.5	76.3	12.2	8.0
B4-00	0.0	0.0	0.0	0.2	2.8	77.3	12.4	7.2
A-7	0.0	0.0	0.0	0.1	2.5	81.1	10.2	6.1
D6-01	0.0	0.0	0.1	0.8	41.4	54.6	1.4	1.6

ANALYTICAL RESOURCES INCORPORATED

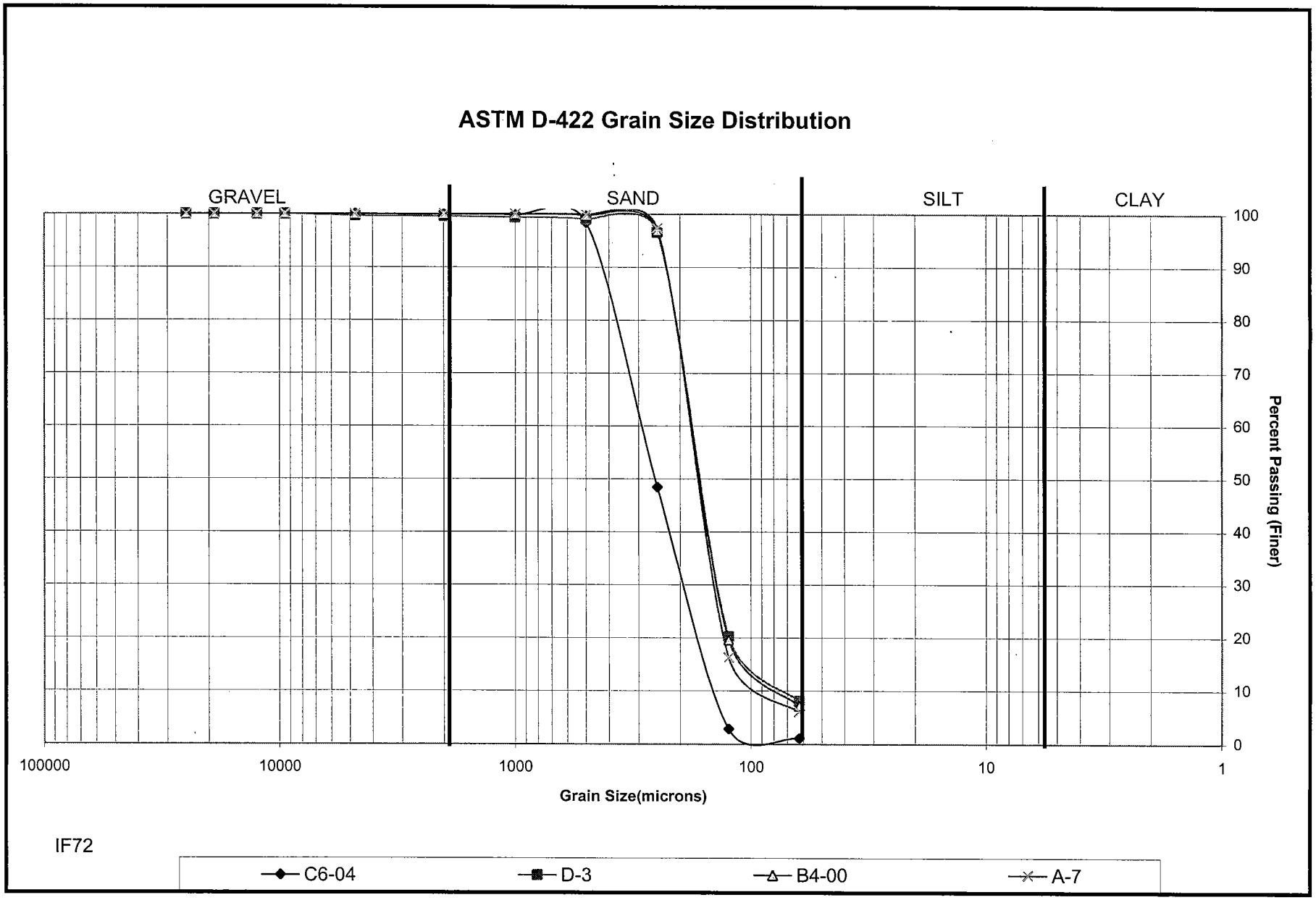
ASTM D-422 Grain Size Distribution



IF72

CD-6-02 D6-04 E-2 C6-03

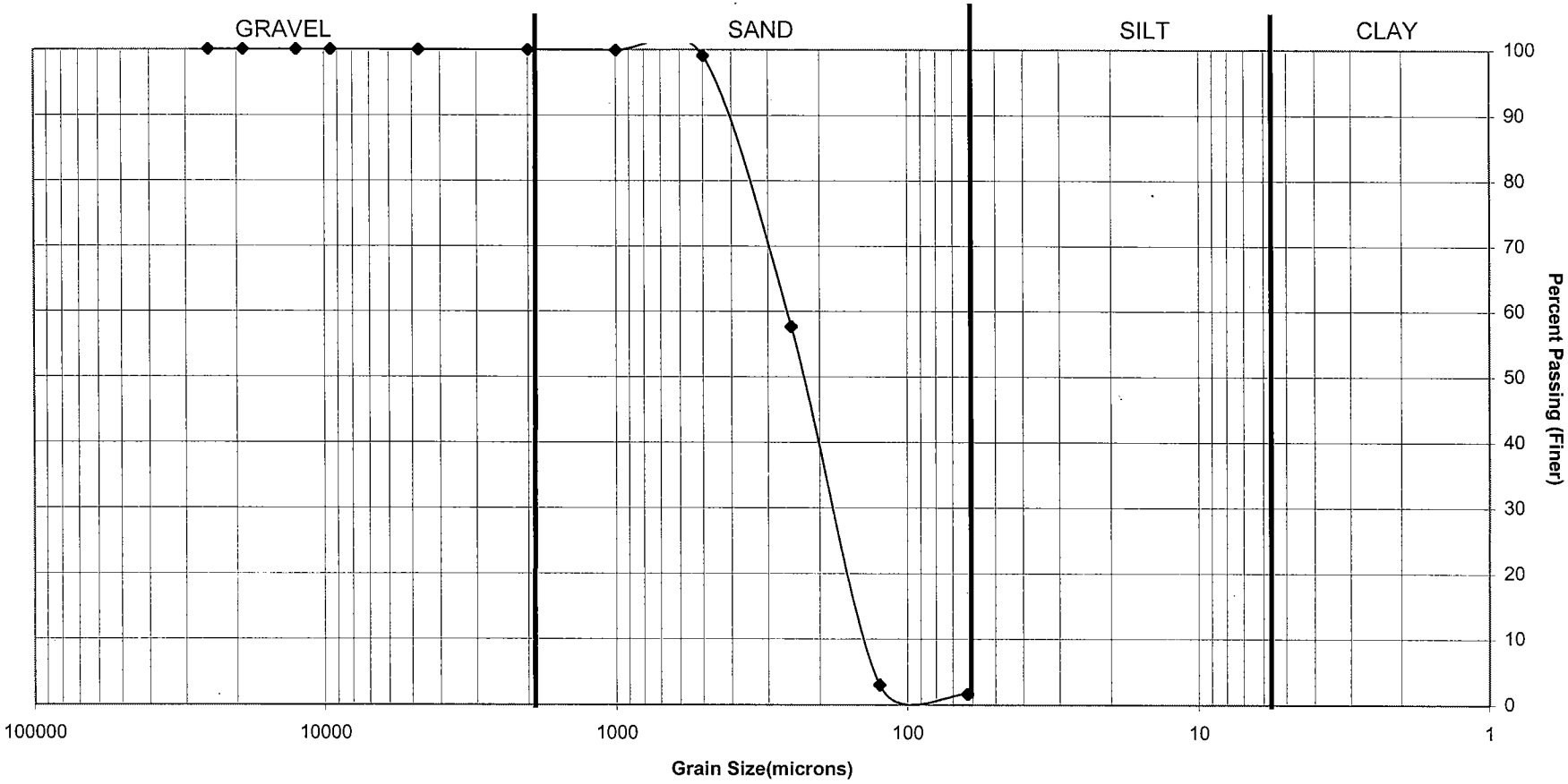
ANALYTICAL RESOURCES INCORPORATED



IF72

ANALYTICAL RESOURCES INCORPORATED

ASTM D-422 Grain Size Distribution



IF72

D6-01

ANALYTICAL RESOURCES INCORPORATED

Sieve Analysis - PSEP

Client / Job No.: Weston ARI Job No.: IF72 Set-up Date: 7/1/05

Sieve Analysis

Sieve set	1	2	1	2	1	2	1	2
Client Sample ID								
ROSA Sample ID	A	B	C	D	E	F	G	H
Tare Number	141	164	123	108	TC 179 ~~50.77~~	219	138	163
Tare Weight	51.41	50.29	50.61	50.88	50.77	49.92	50.83	50.05
Wet Weight	244.50	202.50	194.55	221.98	222.29	167.87	219.80	225.19
Dry Weight	198.26	166.64	156.10	184.61	185.28	137.99	180.57	182.10
Wt after 230 Wash	196.17	163.40	146.28	181.32	183.72	130.94	171.61	174.21
2"	51.41	50.31	50.63	50.89	50.77	49.92	50.85	50.06
1"	↓	↓	↓	↓	↓	↓	↓	↓
3/4"	↓	↓	↓	↓	↓	↓	↓	↓
1/2"	↓	↓	↓	↓	↓	↓	↓	↓
3/8"	↓	↓	↓	↓	↓	↓	↓	↓
#4	—	—	—	—	—	50.22	50.91	—
#10	51.47	—	50.74	50.92	50.89	50.31	50.94	50.08
#18	51.61	50.32	50.84	51.03	51.08	50.49	50.98	50.13
#35	53.79	50.40	51.25	52.63	52.96	50.77	51.25	50.27
#60	123.12	54.32	54.12	94.30	120.15	52.94	54.92	53.55
#120	193.09	149.65	126.45	177.56	181.48	120.18	155.15	160.61
#230	195.92	162.87	145.58	181.01	183.79	130.91	171.24	174.12
Pan	196.08	163.51	146.53	181.27	183.82	131.23	171.91	174.43

Notes:

1115F- B
Rev. 0

ANALYTICAL RESOURCES INCORPORATED

Sieve Analysis - PSEP

Client / Job No.: Weston ARI Job No.: IF72 Set-up Date: 7/1/05

Sieve Analysis

	1							
Client Sample ID								
ROSA Sample ID	I							
Tare Number	209							
Tare Weight	49.75							
Wet Weight	216.99							
Dry Weight	178.97							
Wt after 230 Wash	176.98							
2"	49.77							
1"	↓							
3/4"								
1/2"								
3/8"								
#4	49.81							
#10	49.85							
#18	49.95							
#35	51.02							
#60	104.49							
#120	175.08							
#230	176.92							
Pan	177.01							

Notes:

1115F- B
Rev. 0

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: CD-6-02
ARI ID: 05-11183 IF72A

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	77.60
Total Organic Carbon	07/13/05 071305#1	Plumb,1981	Percent	0.020	0.098

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: D6-04
ARI ID: 05-11184 IF72B

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	76.80
Total Organic Carbon	07/13/05 071305#1	Plumb,1981	Percent	0.020	0.229

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: E-2
ARI ID: 05-11185 IF72C

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	75.80
Total Organic Carbon	07/13/05 071305#1	Plumb,1981	Percent	0.020	0.602

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: C6-03
ARI ID: 05-11186 IF72D

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	77.90
Total Organic Carbon	07/13/05 071305#1	Plumb,1981	Percent	0.020	0.109

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized: BL
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: C6-04
ARI ID: 05-11187 IF72E

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	79.00
Total Organic Carbon	07/14/05 071405#1	Plumb,1981	Percent	0.020	0.083

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: D-3
ARI ID: 05-11188 IF72F

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	75.20
Total Organic Carbon	07/14/05 071405#1	Plumb,1981	Percent	0.020	0.501

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: B4-00
ARI ID: 05-11189 IF72G

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	76.90
Total Organic Carbon	07/14/05 071405#1	Plumb,1981	Percent	0.020	0.501

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: A-7
ARI ID: 05-11190 IF72H

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	77.60
Total Organic Carbon	07/13/05 071305#1	Plumb,1981	Percent	0.020	0.691

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Client ID: D6-01
ARI ID: 05-11191 IF72I

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/12/05 071205#1	EPA 160.3	Percent	0.01	78.10
Total Organic Carbon	07/13/05 071305#1	Plumb,1981	Percent	0.020	0.072

RL Analytical reporting limit
U Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	07/12/05	Percent	< 0.01 U
Total Organic Carbon	07/13/05	Percent	< 0.020 U
	07/14/05		< 0.020 U

LAB CONTROL RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Total Organic Carbon	07/13/05	Percent	0.509	0.500	101.8%
	07/14/05		0.478	0.500	95.6%

STANDARD REFERENCE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
Total Organic Carbon	07/13/05	Percent	3.85	3.35	114.9%
NIST #8704	07/14/05		3.29	3.35	98.2%

REPLICATE RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: IF72A Client ID: CD-6-02					
Total Solids	07/12/05	Percent	77.60	77.70 77.90	0.2%
Total Organic Carbon	07/13/05	Percent	0.098	0.085 0.064	20.8%

MS/MSD RESULTS-CONVENTIONALS
IF72-Weston Solutions, Inc.

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 07/15/05

Project: MCR - COLUMBIA RIVER
Event: NA
Date Sampled: 06/05/05
Date Received: 06/30/05

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: IF72A Client ID: CD-6-02						
Total Organic Carbon	07/13/05	Percent	0.098	0.742	0.591	109.0%

October 12, 2005

Dear Bill;

Please find enclosed the results for 9 grain size samples for your job Columbia River-MCR received on September 23, 2005. These samples were processed according to procedures described by Plumb, 1981. All analyses were performed consistent with our laboratory's quality assurance program, and all samples met the quality control criteria specified in the above methods and/or our internal SOPs.

We will dispose of the samples in 3 months unless you specify otherwise. Please let me know if you have any questions.

Sincerely,

Sheila Holt
Benthic Laboratory Manager

GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.01
Client Sample Name: A7
Total sample weight: 28.751 grams

-------- Size ------		Weight		Cumulative
Microns	Phi	grams	Percent	Percent
2000.000	-1.0	0.009	0.031	0.031
1414.214	-0.5	0.007	0.024	0.056
1000.000	0.0	0.016	0.056	0.111
707.107	0.5	0.014	0.049	0.160
500.000	1.0	0.036	0.125	0.285
353.553	1.5	0.165	0.574	0.859
250.000	2.0	0.713	2.480	3.339
176.777	2.5	6.183	21.506	24.845
125.000	3.0	14.376	50.003	74.847
88.388	3.5	3.937	13.694	88.541
62.500	4.0	0.625	2.174	90.715
31.250	5.0	0.456	1.585	92.300
15.625	6.0	0.166	0.576	92.876
7.812	7.0	0.456	1.585	94.461
3.906	8.0	0.414	1.441	95.902
1.953	9.0	0.083	0.288	96.190
< 1.953	> 9.0	1.095	3.810	100.000

% < 4 phi = 9.285
% > 1 phi = 0.160
% gravel = 0.031
% sand = 90.683
% silt = 5.187
% clay = 4.098

Sample Statistics

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.752	148.49	2.814	142.17	0.520	0.121

5th percentile = 2.039
16th percentile = 2.294
50th percentile = 2.752
84th percentile = 3.334
95th percentile = 7.374

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Carlsbad, CA 92008

GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.02
Client Sample Name: C6-B
Total sample weight: 30.672 grams

-------- Size ------		Weight		Cumulative
Microns	Phi	grams	Percent	Percent
2000.000	-1.0	0.104	0.339	0.339
1414.214	-0.5	0.012	0.039	0.378
1000.000	0.0	0.060	0.196	0.574
707.107	0.5	0.131	0.427	1.001
500.000	1.0	0.334	1.089	2.090
353.553	1.5	1.391	4.535	6.625
250.000	2.0	8.762	28.567	35.192
176.777	2.5	13.703	44.677	79.869
125.000	3.0	4.803	15.659	95.528
88.388	3.5	0.585	1.907	97.435
62.500	4.0	0.064	0.209	97.644
31.250	5.0	0.083	0.270	97.914
15.625	6.0	0.041	0.135	98.049
7.812	7.0	0.124	0.405	98.455
3.906	8.0	0.083	0.270	98.725
1.953	9.0	0.041	0.135	98.860
< 1.953	> 9.0	0.350	1.140	100.000

% < 4 phi = 2.356
% > 1 phi = 1.001
% gravel = 0.339
% sand = 97.305
% silt = 1.080
% clay = 1.275

Sample Statistics

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.166	222.87	2.148	225.63	0.484	-0.037

5th percentile = 1.321
16th percentile = 1.664
50th percentile = 2.166
84th percentile = 2.632
95th percentile = 2.983

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GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.03
Client Sample Name: C6-A
Total sample weight: 31.876 grams

Size Microns	Size Phi	Weight grams	Percent	Cumulative Percent
2000.000	-1.0	0.131	0.411	0.411
1414.214	-0.5	0.062	0.195	0.605
1000.000	0.0	0.063	0.198	0.803
707.107	0.5	0.103	0.323	1.126
500.000	1.0	0.386	1.211	2.337
353.553	1.5	3.099	9.722	12.059
250.000	2.0	6.418	20.134	32.194
176.777	2.5	11.616	36.442	68.635
125.000	3.0	7.793	24.448	93.083
88.388	3.5	1.461	4.583	97.667
62.500	4.0	0.104	0.326	97.993
31.250	5.0	0.041	0.130	98.123
15.625	6.0	0.041	0.130	98.253
7.812	7.0	0.041	0.130	98.383
3.906	8.0	0.041	0.130	98.513
1.953	9.0	0.041	0.130	98.643
< 1.953	> 9.0	0.433	1.357	100.000

% < 4 phi = 2.007
% > 1 phi = 1.126
% gravel = 0.411
% sand = 97.582
% silt = 0.520
% clay = 1.487

Sample Statistics

Median phi	Median microns	Mean phi	Mean microns	Dispersion	Skewness
2.244	211.05	2.206	216.73	0.608	-0.063

5th percentile = 1.137
16th percentile = 1.598
50th percentile = 2.244
84th percentile = 2.814
95th percentile = 3.209

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GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.04
Client Sample Name: D6-C
Total sample weight: 32.701 grams

-------- Size ------		Weight		Cumulative
Microns	Phi	grams	Percent	Percent
2000.000	-1.0	0.000	0.000	0.000
1414.214	-0.5	0.008	0.024	0.024
1000.000	0.0	0.031	0.095	0.119
707.107	0.5	0.092	0.281	0.401
500.000	1.0	0.312	0.954	1.355
353.553	1.5	1.392	4.257	5.611
250.000	2.0	8.145	24.907	30.519
176.777	2.5	12.987	39.714	70.233
125.000	3.0	7.428	22.715	92.947
88.388	3.5	1.568	4.795	97.742
62.500	4.0	0.140	0.428	98.170
31.250	5.0	0.041	0.127	98.297
15.625	6.0	0.041	0.127	98.424
7.812	7.0	0.041	0.127	98.550
3.906	8.0	0.041	0.127	98.677
1.953	9.0	0.041	0.127	98.804
< 1.953	> 9.0	0.391	1.196	100.000

% < 4 phi = 1.830
% > 1 phi = 0.401
% gravel = 0.000
% sand = 98.170
% silt = 0.507
% clay = 1.323

Sample Statistics

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.245	210.91	2.256	209.38	0.547	0.019

5th percentile = 1.428
16th percentile = 1.709
50th percentile = 2.245
84th percentile = 2.803
95th percentile = 3.214

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GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.05
Client Sample Name: D6-B
Total sample weight: 32.528 grams

-------- Size ------		Weight		Cumulative
Microns	Phi	grams	Percent	Percent
2000.000	-1.0	0.000	0.000	0.000
1414.214	-0.5	0.012	0.037	0.037
1000.000	0.0	0.073	0.224	0.261
707.107	0.5	0.150	0.461	0.722
500.000	1.0	0.632	1.943	2.665
353.553	1.5	5.301	16.297	18.962
250.000	2.0	9.143	28.108	47.071
176.777	2.5	12.042	37.021	84.091
125.000	3.0	4.197	12.903	96.994
88.388	3.5	0.319	0.981	97.975
62.500	4.0	0.019	0.058	98.033
31.250	5.0	0.041	0.127	98.161
15.625	6.0	0.041	0.127	98.288
7.812	7.0	0.083	0.255	98.543
3.906	8.0	0.083	0.255	98.797
1.953	9.0	0.041	0.127	98.925
< 1.953	> 9.0	0.350	1.075	100.000

% < 4 phi = 1.967
% > 1 phi = 0.722
% gravel = 0.000
% sand = 98.033
% silt = 0.764
% clay = 1.203

Sample Statistics

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.040	243.24	1.954	258.11	0.545	-0.157

5th percentile = 1.072
16th percentile = 1.409
50th percentile = 2.040
84th percentile = 2.499
95th percentile = 2.923

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GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.06
Client Sample Name: D6-A
Total sample weight: 30.559 grams

-------- Size ------		Weight		Cumulative
Microns	Phi	grams	Percent	Percent
2000.000	-1.0	0.031	0.101	0.101
1414.214	-0.5	0.001	0.003	0.105
1000.000	0.0	0.006	0.020	0.124
707.107	0.5	0.037	0.121	0.245
500.000	1.0	0.158	0.517	0.762
353.553	1.5	2.533	8.289	9.051
250.000	2.0	5.633	18.433	27.485
176.777	2.5	11.002	36.003	63.487
125.000	3.0	7.999	26.176	89.663
88.388	3.5	1.484	4.856	94.519
62.500	4.0	0.217	0.710	95.229
31.250	5.0	0.213	0.698	95.927
15.625	6.0	0.085	0.279	96.206
7.812	7.0	0.213	0.698	96.903
3.906	8.0	0.213	0.698	97.601
1.953	9.0	0.043	0.140	97.740
< 1.953	> 9.0	0.690	2.260	100.000

% < 4 phi = 4.771
% > 1 phi = 0.245
% gravel = 0.101
% sand = 95.128
% silt = 2.372
% clay = 2.399

Sample Statistics

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.313	201.28	2.290	204.45	0.602	-0.037

5th percentile = 1.256
16th percentile = 1.688
50th percentile = 2.313
84th percentile = 2.892
95th percentile = 3.839

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GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.07
Client Sample Name: B4
Total sample weight: 29.519 grams

-------- Size ------		Weight		Cumulative
Microns	Phi	grams	Percent	Percent
2000.000	-1.0	0.011	0.037	0.037
1414.214	-0.5	0.004	0.014	0.051
1000.000	0.0	0.020	0.068	0.119
707.107	0.5	0.031	0.105	0.224
500.000	1.0	0.056	0.190	0.413
353.553	1.5	0.109	0.369	0.783
250.000	2.0	0.701	2.375	3.157
176.777	2.5	6.802	23.043	26.200
125.000	3.0	12.556	42.536	68.736
88.388	3.5	3.430	11.620	80.355
62.500	4.0	0.674	2.283	82.639
31.250	5.0	0.725	2.456	85.094
15.625	6.0	0.725	2.456	87.550
7.812	7.0	0.213	0.722	88.272
3.906	8.0	1.151	3.900	92.172
1.953	9.0	0.171	0.578	92.750
< 1.953	> 9.0	2.140	7.250	100.000

% < 4 phi = 17.361
% > 1 phi = 0.224
% gravel = 0.037
% sand = 82.601
% silt = 9.533
% clay = 7.828

Sample Statistics

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.780	145.62	3.417	93.65	1.138	0.560

5th percentile = 2.040
16th percentile = 2.279
50th percentile = 2.780
84th percentile = 4.554
95th percentile = .
*** 95th percentile not reached ***

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GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.08
Client Sample Name: D3
Total sample weight: 30.749 grams

Size Microns	Size Phi	Weight grams	Percent	Cumulative Percent
2000.000	-1.0	0.065	0.211	0.211
1414.214	-0.5	0.125	0.407	0.618
1000.000	0.0	0.228	0.741	1.359
707.107	0.5	0.787	2.559	3.919
500.000	1.0	1.931	6.280	10.199
353.553	1.5	6.927	22.528	32.727
250.000	2.0	5.425	17.643	50.370
176.777	2.5	7.086	23.045	73.414
125.000	3.0	6.171	20.069	93.483
88.388	3.5	1.095	3.561	97.045
62.500	4.0	0.133	0.433	97.477
31.250	5.0	0.128	0.416	97.893
15.625	6.0	0.043	0.139	98.032
7.812	7.0	0.043	0.139	98.170
3.906	8.0	0.043	0.139	98.309
1.953	9.0	0.043	0.139	98.448
< 1.953	> 9.0	0.477	1.552	100.000

% < 4 phi = 2.523
% > 1 phi = 3.919
% gravel = 0.211
% sand = 97.266
% silt = 0.832
% clay = 1.691

Sample Statistics

Median phi	Median microns	Mean phi	Mean microns	Dispersion	Skewness
1.990	251.82	1.946	259.49	0.817	-0.053

5th percentile = 0.586
16th percentile = 1.129
50th percentile = 1.990
84th percentile = 2.764
95th percentile = 3.213

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GRAIN SIZE ANALYSIS

Contract Number/Name: Columbia River-MCR
Contact person: William Gardiner
Date of analysis: 03Oct05
Date of report: 12Oct05
Analysis method: Sieve/pipette (Plumb, 1981)
Sample Identification: B050923.09
Client Sample Name: E2
Total sample weight: 29.690 grams

-------- Size ------		Weight		Cumulative
Microns	Phi	grams	Percent	Percent
2000.000	-1.0	0.015	0.051	0.051
1414.214	-0.5	0.010	0.034	0.084
1000.000	0.0	0.021	0.071	0.155
707.107	0.5	0.030	0.101	0.256
500.000	1.0	0.722	2.432	2.688
353.553	1.5	0.819	2.759	5.446
250.000	2.0	4.983	16.783	22.230
176.777	2.5	12.647	42.597	64.827
125.000	3.0	5.560	18.727	83.553
88.388	3.5	0.944	3.180	86.733
62.500	4.0	0.008	0.027	86.760
31.250	5.0	0.895	3.016	89.776
15.625	6.0	0.171	0.574	90.350
7.812	7.0	0.640	2.154	92.504
3.906	8.0	0.213	0.718	93.222
1.953	9.0	0.256	0.862	94.084
< 1.953	> 9.0	1.756	5.916	100.000

% < 4 phi = 13.240
% > 1 phi = 0.256
% gravel = 0.051
% sand = 86.709
% silt = 6.462
% clay = 6.778

Sample Statistics

Median		Mean		Dispersion	Skewness
phi	microns	phi	microns		
2.326	199.44	2.442	183.99	0.628	0.185

5th percentile = 1.419
16th percentile = 1.814
50th percentile = 2.326
84th percentile = 3.070
95th percentile = .
*** 95th percentile not reached ***

Weston Solutions, Inc.
2433 Impala Dr.
Carlsbad, CA 92008

October 17, 2005 Batch No.: 050930A

Dear Bill:

Enclosed are the results of samples submitted to our laboratory on 23Sep05 for analysis of TOC (Method EPA 415.1, modified). For your reference, these samples have been assigned our batch number 050930A.

All analyses were performed consistent with our laboratory's quality assurance program. All samples met the quality control criteria specified in the above methods and/or our internal SOPs. We will dispose of the samples in 3 months unless otherwise specified.

Please call if you have any questions.

Sincerely,

Sheila Holt
Benthic Laboratory Manager

Analytical Report

Project: Columbia River-MCR
Contact: William Gardiner
Sample Matrix: Sediment

Date Received: 23Sep05
Date Analyzed: 30Sep05
Batch No.: 050930A

Total Organic Carbon
Analysis Method: EPA 415.1, modified
Percent (%)

Laboratory I.D.	Client I.D.	MRL	Result
B050923.01	A7	0.05	0.266
B050923.02	C6-B	0.05	0.062
B050923.03	C6-A	0.05	E0.045
B050923.04	D6-C	0.05	E0.041
B050923.05	D6-B	0.05	0.050
B050923.06	D6-A	0.05	0.170
B050923.07	B4	0.05	0.497
B050923.08	D3	0.05	0.188
B050923.09	E2	0.05	0.488

E= Estimated value below the MRL and above the MDL

Method blank ND

Approved by:_____ Date: _____

QA/QC Report

Project: Columbia River-MCR
Contact: William Gardiner
Sample Matrix: Sediment

Date Received: 23Sep05
Date Analyzed: 30Sep05
Batch No.: 050930A

Duplicate Summary
Total Organic Carbon
Percent (%)

Laboratory I.D.	Client I.D.	Sample Result	Duplicate Result	Average	RPD
B050923.06	D6-A	0.170	0.167	0.169	1.78

EPA 415.1, modified

Approved by:_____ Date: _____