ANALYTICAL REPORT

Lab Number:	L1629119
Client:	Floyd Snider Inc 601 Union Street Suite 600 Seattle, WA 98101
ATTN:	Teri Floyd
Phone:	(206) 292-2078
Project Name:	LDW/AC PILOT STUDY
Project Number:	LY15160310
Report Date:	10/06/16

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320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1629119-01	LDW-BA-SC-ENR-CA-CORE	SEDIMENT	LDW	09/10/16 13:05	09/15/16
L1629119-02	LDW-BA-SC-ENR-CB-CORE	SEDIMENT	LDW	09/10/16 12:10	09/15/16
L1629119-03	LDW-BA-SC-ENR-CC-CORE	SEDIMENT	LDW	09/10/16 12:25	09/15/16
L1629119-04	LDW-BA-SC-ENR-CD-CORE	SEDIMENT	LDW	09/10/16 13:35	09/15/16
L1629119-05	LDW-BA-SC-ENR-CE-CORE	SEDIMENT	LDW	09/12/16 11:45	09/15/16
L1629119-06	LDW-BA-SC-ENR+AC-CA-CORE	SEDIMENT	LDW	09/09/16 10:08	09/15/16
L1629119-07	LDW-BA-SC-ENR+AC-CB-CORE	SEDIMENT	LDW	09/09/16 09:45	09/15/16
L1629119-08	LDW-BA-SC-ENR+AC-CC-CORE	SEDIMENT	LDW	09/09/16 16:00	09/15/16
L1629119-09	LDW-BA-SC-ENR+AC-CD-CORE	SEDIMENT	LDW	09/09/16 16:30	09/15/16
L1629119-10	LDW-BA-SC-ENR+AC-CE-CORE	SEDIMENT	LDW	09/09/16 16:50	09/15/16
L1629119-11	LDW-BA-IN-ENR-CA-CORE	SEDIMENT	LDW	09/14/16 11:30	09/15/16
L1629119-12	LDW-BA-IN-ENR-CB-CORE	SEDIMENT	LDW	09/14/16 10:40	09/15/16
L1629119-13	LDW-BA-IN-ENR-CC-CORE	SEDIMENT	LDW	09/14/16 11:42	09/15/16
L1629119-14	LDW-BA-IN-ENR+AC-CA-CORE	SEDIMENT	LDW	09/14/16 10:20	09/15/16
L1629119-15	LDW-BA-IN-ENR+AC-CB-CORE	SEDIMENT	LDW	09/14/16 10:55	09/15/16
L1629119-16	LDW-BA-IN-ENR+AC-CC-CORE	SEDIMENT	LDW	09/14/16 09:57	09/15/16
L1629119-17	LDW-BA-IN-ENR+AC-CD-CORE	SEDIMENT	LDW	09/13/16 11:40	09/15/16
L1629119-18	LDW-BA-SC-ENR-CA-CORE	SOIL	LDW	09/10/16 13:05	09/15/16

Project Name: LDW/AC PILOT STUDY
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Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: LDW/AC PILOT STUDY **Lab Number:** L1629119
Project Number: LY15160310 **Report Date:** 10/06/16

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

Per client request, sample L1629119-01 was also logged as L1629119-18 for a grain size "triplicate". In addition, per client request, samples L1629119-04, -05, -09, -10, and -17, were placed on hold, and were not analyzed.

Black Carbon

The WG939414-4/-5 MS/MSD RPD, performed on L1629119-01, is outside the acceptance criteria for % Soot (Rep 1) (28%).

Total Organic Carbon

The WG939422-5 MSD recovery, performed on L1629119-01, is outside the acceptance criteria for Total Organic Carbon (Rep2) (141%); however, the associated LCS recoveries are within overall method allowances. No further action was required.

Grain Size Analysis

The WG939468-1 Laboratory Duplicate RPDs, performed on L1629119-01, are outside the acceptance criteria for % Coarse Sand (119%), % Medium Sand (126%), % Fine Sand (23%), % Total Sand (76%), % Clay Fine (33%), and % Total Fines (21%). The elevated RPDs have been attributed to the non-homogeneous nature of the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Susan E O'Neil Susan O' Neil

Title: Technical Director/Representative Date: 10/06/16

INORGANICS
&
MISCELLANEOUS

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-01
Client ID: LDW-BA-SC-ENR-CA-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/10/16 13:05
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.60		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	2.54		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	0.100		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	0.100		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	1.10		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	3.20		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	9.30		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	13.6		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	66.3		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	20.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	86.3		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.317		%	0.010	NA	1	-	10/05/16 12:03	91,-	AR
% Soot (Rep 2)	0.280		%	0.010	NA	1	-	10/05/16 12:03	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

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Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-02
Client ID: LDW-BA-SC-ENR-CB-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/10/16 12:10
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.80		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	2.61		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	0.600		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	1.90		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	8.50		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	11.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	73.8		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	15.2		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	89.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.148		%	0.010	NA	1	-	10/05/16 12:44	91,-	AR
% Soot (Rep 2)	0.141		%	0.010	NA	1	-	10/05/16 12:44	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-03
Client ID: LDW-BA-SC-ENR-CC-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/10/16 12:25
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	3.05		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	2.55		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	2.30		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	11.3		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	12.4		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	26.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	62.1		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	11.9		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	74.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.148		%	0.010	NA	1	-	10/05/16 13:20	91,-	AR
% Soot (Rep 2)	0.181		%	0.010	NA	1	-	10/05/16 13:20	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-06
Client ID: LDW-BA-SC-ENR+AC-CA-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/09/16 10:08
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.27		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	2.14		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	8.30		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	8.30		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	4.10		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	12.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	17.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	34.1		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	49.3		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	8.30		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	57.6		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.242		%	0.010	NA	1	-	10/05/16 14:31	91,-	AR
% Soot (Rep 2)	0.193		%	0.010	NA	1	-	10/05/16 14:31	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-07
Client ID: LDW-BA-SC-ENR+AC-CB-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/09/16 09:45
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.21		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	2.11		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	0.100		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	0.100		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	1.30		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	16.3		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	23.8		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	41.4		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	50.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	8.00		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	58.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.537		%	0.010	NA	1	-	10/05/16 13:40	91,-	AR
% Soot (Rep 2)	0.449		%	0.010	NA	1	-	10/05/16 13:40	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-08
Client ID: LDW-BA-SC-ENR+AC-CC-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/09/16 16:00
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	2.03		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	1.72		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	1.40		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	9.30		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	18.4		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	29.1		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	60.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	10.4		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	70.9		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.344		%	0.010	NA	1	-	10/05/16 13:50	91,-	AR
% Soot (Rep 2)	0.402		%	0.010	NA	1	-	10/05/16 13:50	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-11
Client ID: LDW-BA-IN-ENR-CA-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/14/16 11:30
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.38		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	1.51		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	0.200		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	0.200		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	0.600		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	12.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	33.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	46.1		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	48.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	5.20		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	53.7		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.231		%	0.010	NA	1	-	10/05/16 14:41	91,-	AR
% Soot (Rep 2)	0.293		%	0.010	NA	1	-	10/05/16 14:41	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-12
Client ID: LDW-BA-IN-ENR-CB-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/14/16 10:40
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.29		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	1.28		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	0.600		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	11.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	28.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	40.6		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	53.3		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	6.10		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	59.4		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.073		%	0.010	NA	1	-	10/05/16 14:51	91,-	AR
% Soot (Rep 2)	0.059		%	0.010	NA	1	-	10/05/16 14:51	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-13
Client ID: LDW-BA-IN-ENR-CC-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/14/16 11:42
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.56		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	1.33		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	0.500		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	0.500		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	2.00		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	15.6		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	28.4		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	46.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	46.9		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	6.60		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	53.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.039		%	0.010	NA	1	-	10/05/16 15:54	91,-	AR
% Soot (Rep 2)	0.043		%	0.010	NA	1	-	10/05/16 15:54	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-14
Client ID: LDW-BA-IN-ENR+AC-CA-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/14/16 10:20
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.59		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	1.60		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	0.100		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	0.100		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	0.800		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	5.20		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	27.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	33.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	57.2		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	9.20		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	66.4		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.111		%	0.010	NA	1	-	10/05/16 15:11	91,-	AR
% Soot (Rep 2)	0.107		%	0.010	NA	1	-	10/05/16 15:11	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-15
Client ID: LDW-BA-IN-ENR+AC-CB-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/14/16 10:55
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.65		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	1.40		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	0.500		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	0.500		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	0.800		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	9.60		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	34.3		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	44.7		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	48.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	6.80		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	54.8		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.058		%	0.010	NA	1	-	10/05/16 15:33	91,-	AR
% Soot (Rep 2)	0.056		%	0.010	NA	1	-	10/05/16 15:33	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-16
Client ID: LDW-BA-IN-ENR+AC-CC-CORE
Sample Location: LDW
Matrix: Sediment

Date Collected: 09/14/16 09:57
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.47		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	1.43		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	0.700		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	0.700		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	0.900		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	11.0		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	37.2		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	49.1		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	45.3		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	4.90		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	50.2		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
General Chemistry - Mansfield Lab										
% Soot (Rep 1)	0.119		%	0.010	NA	1	-	10/05/16 15:44	91,-	AR
% Soot (Rep 2)	0.110		%	0.010	NA	1	-	10/05/16 15:44	91,-	AR

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

SAMPLE RESULTS

Lab ID: L1629119-18
Client ID: LDW-BA-SC-ENR-CA-CORE
Sample Location: LDW
Matrix: Soil

Date Collected: 09/10/16 13:05
Date Received: 09/15/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Grain Size Analysis - Mansfield Lab										
Cobbles	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Gravel	ND		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Gravel	0.300		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Gravel	0.300		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Coarse Sand	1.70		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Medium Sand	3.90		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Fine Sand	8.50		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Sand	14.1		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Silt Fine	74.1		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Clay Fine	11.5		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR
% Total Fines	85.6		%	0.100	NA	1	-	10/06/16 10:15	12,D422	AR

Project Name: LDW/AC PILOT STUDY **Lab Number:** L1629119

Project Number: LY15160310 **Report Date:** 10/06/16

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab for sample(s): 01-03,06-08,11-16 Batch: WG939414-1										
% Soot (Rep 1)	ND		%	0.010	NA	1	-	10/04/16 16:59	91,-	AR
% Soot (Rep 2)	ND		%	0.010	NA	1	-	10/04/16 16:59	91,-	AR
Total Organic Carbon - Mansfield Lab for sample(s): 01-03,06-08,11-16 Batch: WG939422-1										
Total Organic Carbon (Rep1)	ND		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR
Total Organic Carbon (Rep2)	ND		%	0.010	0.010	1	-	10/05/16 10:56	1,9060A	AR

Matrix Spike Analysis
Batch Quality Control

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-03,06-08,11-16 QC Batch ID: WG939414-4 WG939414-5 QC Sample: L1629119-01 Client ID: LDW-BA-SC-ENR-CA-CORE												
% Soot (Rep 1)	0.317	0.758	1.03	94		1.36	101		75-125	**28**	Q	25
% Soot (Rep 2)	0.280	0.66	0.939	100		1.17	97		75-125	22		25
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-03,06-08,11-16 QC Batch ID: WG939422-4 WG939422-5 QC Sample: L1629119-01 Client ID: LDW-BA-SC-ENR-CA-CORE												
Total Organic Carbon (Rep1)	2.60	0.878	3.66	121		3.70	114		75-125	1		25
Total Organic Carbon (Rep2)	2.54	0.915	3.60	116		3.95	**141**	Q	75-125	9		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-03,06-08,11-16 QC Batch ID: WG939414-3 QC Sample: L1629119-01 Client ID: LDW-BA-SC-ENR-CA-CORE						
% Soot (Rep 1)	0.317	0.291	%	9		25
% Soot (Rep 2)	0.280	0.270	%	4		25
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-03,06-08,11-16 QC Batch ID: WG939422-3 QC Sample: L1629119-01 Client ID: LDW-BA-SC-ENR-CA-CORE						
Total Organic Carbon (Rep1)	2.60	2.54	%	2		25
Total Organic Carbon (Rep2)	2.54	2.57	%	1		25
Grain Size Analysis - Mansfield Lab Associated sample(s): 01-03,06-08,11-16,18 QC Batch ID: WG939468-1 QC Sample: L1629119-01 Client ID: LDW-BA-SC-ENR-CA-CORE						
Cobbles	ND	ND	%	NC		20
% Coarse Gravel	ND	ND	%	NC		20
% Fine Gravel	0.100	0.100	%	0		20
% Total Gravel	0.100	0.100	%	0		20
% Coarse Sand	1.10	4.30	%	**119**	Q	20
% Medium Sand	3.20	14.1	%	**126**	Q	20
% Fine Sand	9.30	11.7	%	**23**	Q	20
% Total Sand	13.6	30.1	%	**76**	Q	20
% Silt Fine	66.3	55.5	%	18		20
% Clay Fine	20.0	14.3	%	**33**	Q	20
% Total Fines	86.3	69.8	%	**21**	Q	20

Project Name: LDW/AC PILOT STUDY **Lab Number:** L1629119

Project Number: LY15160310 **Report Date:** 10/06/16

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG939414-2

Parameter	% Recovery	Qual	QC Criteria
% Soot (Rep 1)	108		75-125
% Soot (Rep 2)	108		75-125

Project Name: LDW/AC PILOT STUDY **Lab Number:** L1629119

Project Number: LY15160310 **Report Date:** 10/06/16

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG939422-2

Parameter	% Recovery	Qual	QC Criteria
Total Organic Carbon (Rep1)	111		75-125
Total Organic Carbon (Rep2)	99		75-125

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information	Custody Seal
Cooler	
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629119-01A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-01B	Glass 500ml/16oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-02A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-02B	Glass 500ml/16oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-03A	Glass 500ml/16oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-03B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-04A	Glass 500ml/16oz unpreserved	A	N/A	2.0	Y	Absent	HOLD()
L1629119-04B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	HOLD()
L1629119-05A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	HOLD()
L1629119-05B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	HOLD()

*Values in parentheses indicate holding time in days

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629119-06A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-06B	Glass 500ml/16oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-07A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-07B	Glass 500ml/16oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-08A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-08B	Glass 500ml/16oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-09A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	HOLD()
L1629119-09B	Glass 500ml/16oz unpreserved	B	N/A	2.2	Y	Absent	HOLD()
L1629119-10A	Glass 500ml/16oz unpreserved	A	N/A	2.0	Y	Absent	HOLD()
L1629119-10B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	HOLD()
L1629119-11A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-11B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()

*Values in parentheses indicate holding time in days

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629119-12A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-12B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-13A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-13B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-14A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-14B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-15A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)
L1629119-15B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-16A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-SOOT(28),A2-TOC-9060-2REPS(28)

*Values in parentheses indicate holding time in days

Project Name: LDW/AC PILOT STUDY
Project Number: LY15160310

Lab Number: L1629119
Report Date: 10/06/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629119-16B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()
L1629119-17A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	HOLD()
L1629119-17B	Glass 250ml/8oz unpreserved	B	N/A	2.2	Y	Absent	HOLD()
L1629119-18A	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	A2-HYDRO-TFINE(),A2-HYDRO-CFINE(),A2-HYDRO-CGRAVEL(),A2-HYDRO-FSAND(),A2-HYDRO-MSAND(),A2-HYDRO-TGRAVEL(),A2-HYDRO-CSAND(),A2-HYDRO-SFINE(),A2-HYDRO-TSAND(),A2-HYDRO-COBBLES(),A2-HYDRO-FGRAVEL()

*Values in parentheses indicate holding time in days

Project Name:	LDW/AC PILOT STUDY	**Lab Number:**	L1629119
Project Number:	LY15160310	**Report Date:**	10/06/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Project Name:	LDW/AC PILOT STUDY	**Lab Number:**	L1629119
Project Number:	LY15160310	**Report Date:**	10/06/16

Data Qualifiers

reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.

91 Analysis of Soot following ES&T publications by Accardi-Dey and Gschwend, 2003; and Gustafsson (et. al.), 1997.

LIMITATION OF LIABILITIES

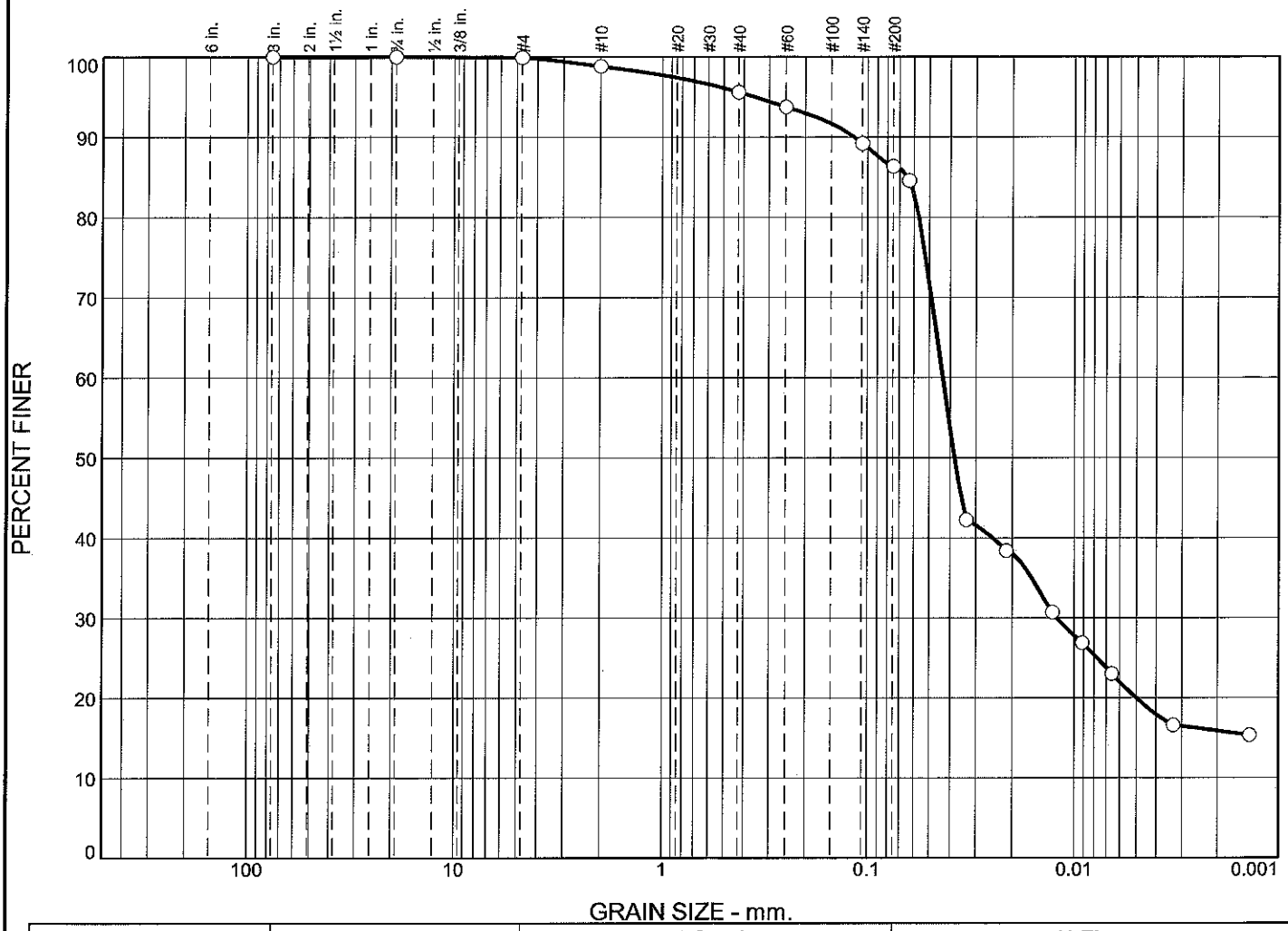
Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

ASTM D422-63

GRAIN SIZE ANALYSIS

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	1.1	3.2	9.3	66.3	20.0

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.0641	0.0433	0.0381	0.0122				

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source:** LDW-BA-SC-ENR-CA-CORE **Sample No.:** L1629119-01

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-SC-ENR-CA-CORE

Sample Number: L1629119-01

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 54.05
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
54.05	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.05	0.00	99.9
		#10	0.59	0.00	98.8
		#40	1.74	0.00	95.6
		#60	1.00	0.00	93.7
		#140	2.46	0.00	89.2
		#200	1.54	0.00	86.3
		#230	0.96	0.00	84.6

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 86.3
Weight of hydrometer sample =54.05
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0165	1.0165	0.0136	16.5	11.9	0.0333	42.3
5.00	20.0	1.0150	1.0150	0.0136	15.0	12.3	0.0214	38.4
15.00	20.0	1.0120	1.0120	0.0136	12.0	13.1	0.0128	30.7
30.00	20.0	1.0105	1.0105	0.0136	10.5	13.5	0.0092	26.9
60.00	20.0	1.0090	1.0090	0.0136	9.0	13.9	0.0066	23.0
250.00	20.0	1.0065	1.0065	0.0136	6.5	14.6	0.0033	16.6
1440.00	20.0	1.0060	1.0060	0.0136	6.0	14.7	0.0014	15.3

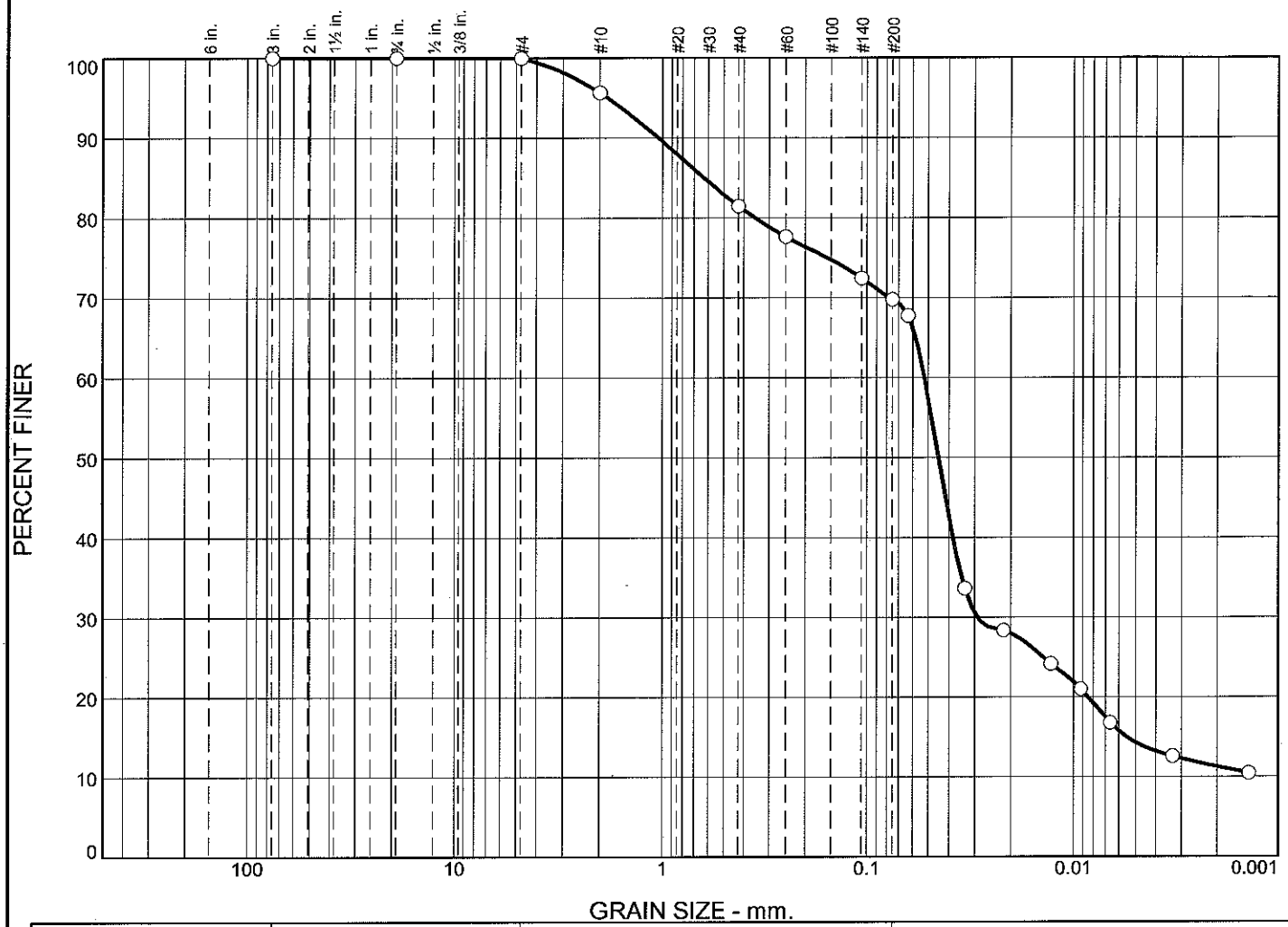
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	1.1	3.2	9.3	13.6	66.3	20.0	86.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0050	0.0122	0.0381	0.0433	0.0566	0.0641	0.1163	0.3557

Fineness Modulus
0.20

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	4.3	14.1	11.7	55.5	14.3

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.6284	0.0525	0.0448	0.0291	0.0055			

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source:** LDW-BA-SC-ENR-CA-CORE **Sample No.:** WG939468-1

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-SC-ENR-CA-CORE

Sample Number: WG939468-1

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 53.20
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
53.20	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.03	0.00	99.9
		#10	2.29	0.00	95.6
		#40	7.54	0.00	81.5
		#60	2.04	0.00	77.6
		#140	2.77	0.00	72.4
		#200	1.41	0.00	69.8
		#230	1.08	0.00	67.7

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 69.8
Weight of hydrometer sample =53.20
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0160	1.0160	0.0136	16.0	12.1	0.0335	33.6
5.00	20.0	1.0135	1.0135	0.0136	13.5	12.7	0.0218	28.4
15.00	20.0	1.0115	1.0115	0.0136	11.5	13.3	0.0128	24.2
30.00	20.0	1.0100	1.0100	0.0136	10.0	13.6	0.0092	21.0
60.00	20.0	1.0080	1.0080	0.0136	8.0	14.2	0.0066	16.8
250.00	20.0	1.0060	1.0060	0.0136	6.0	14.7	0.0033	12.6
1440.00	20.0	1.0050	1.0050	0.0136	5.0	15.0	0.0014	10.5

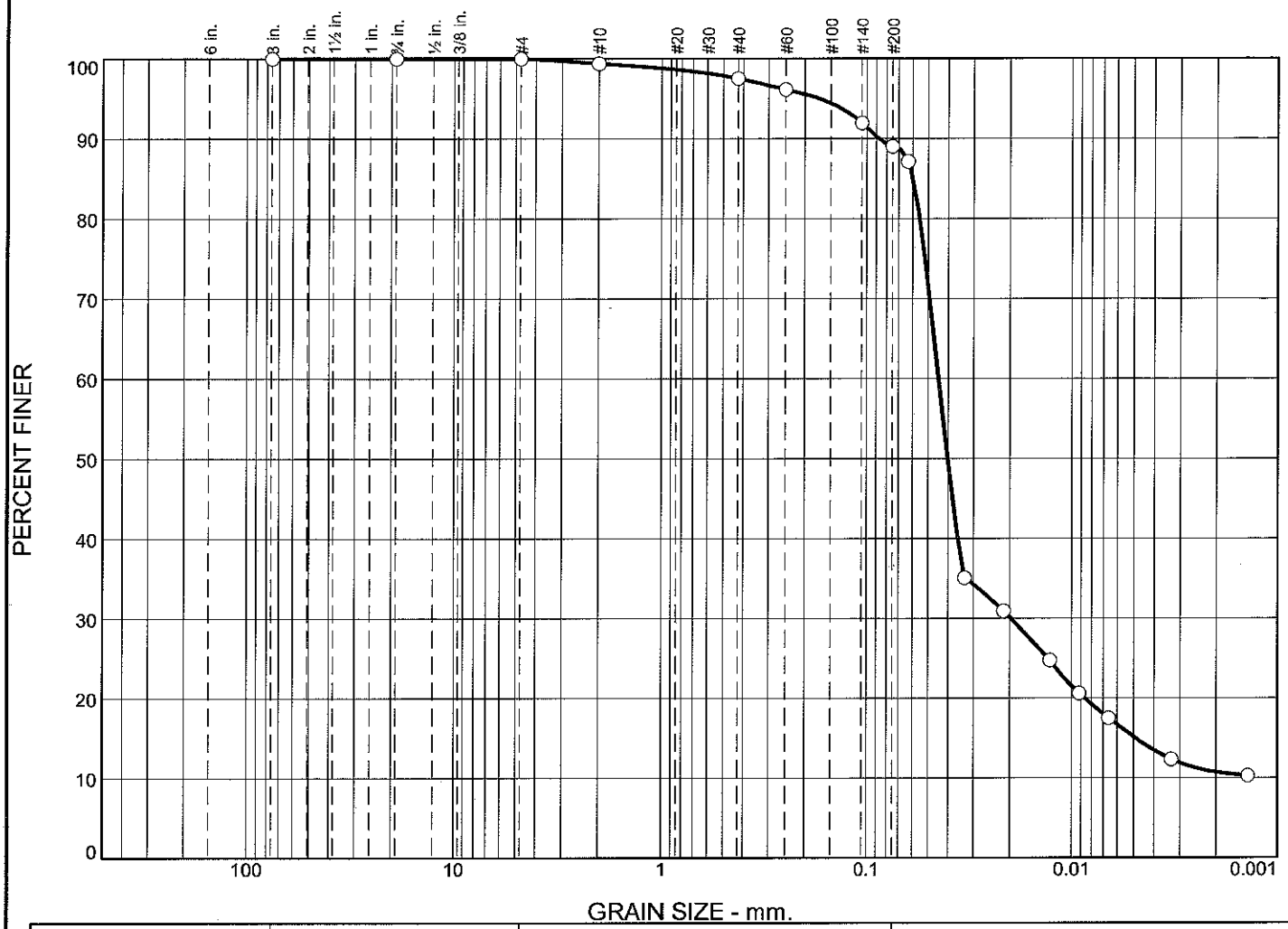
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	4.3	14.1	11.7	30.1	55.5	14.3	69.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0055	0.0085	0.0291	0.0448	0.0525	0.3535	0.6284	1.0501	1.8395

Fineness Modulus
0.74

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.6	1.9	8.5	73.8	15.2

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.0599	0.0445	0.0402	0.0197	0.0049			

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source:** LDW-BA-SC-ENR-CB-CORE **Sample No.:** L1629119-02

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-SC-ENR-CB-CORE

Sample Number: L1629119-02

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 69.16
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
69.16	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.43	0.00	99.4
		#40	1.31	0.00	97.5
		#60	0.93	0.00	96.1
		#140	2.92	0.00	91.9
		#200	2.02	0.00	89.0
		#230	1.30	0.00	87.1

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 89.0
Weight of hydrometer sample =69.16
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0170	1.0170	0.0136	17.0	11.8	0.0331	35.1
5.00	20.0	1.0150	1.0150	0.0136	15.0	12.3	0.0214	30.9
15.00	20.0	1.0120	1.0120	0.0136	12.0	13.1	0.0128	24.7
30.00	20.0	1.0100	1.0100	0.0136	10.0	13.6	0.0092	20.6
60.00	20.0	1.0085	1.0085	0.0136	8.5	14.0	0.0066	17.5
250.00	20.0	1.0060	1.0060	0.0136	6.0	14.7	0.0033	12.3
1440.00	20.0	1.0050	1.0050	0.0136	5.0	15.0	0.0014	10.3

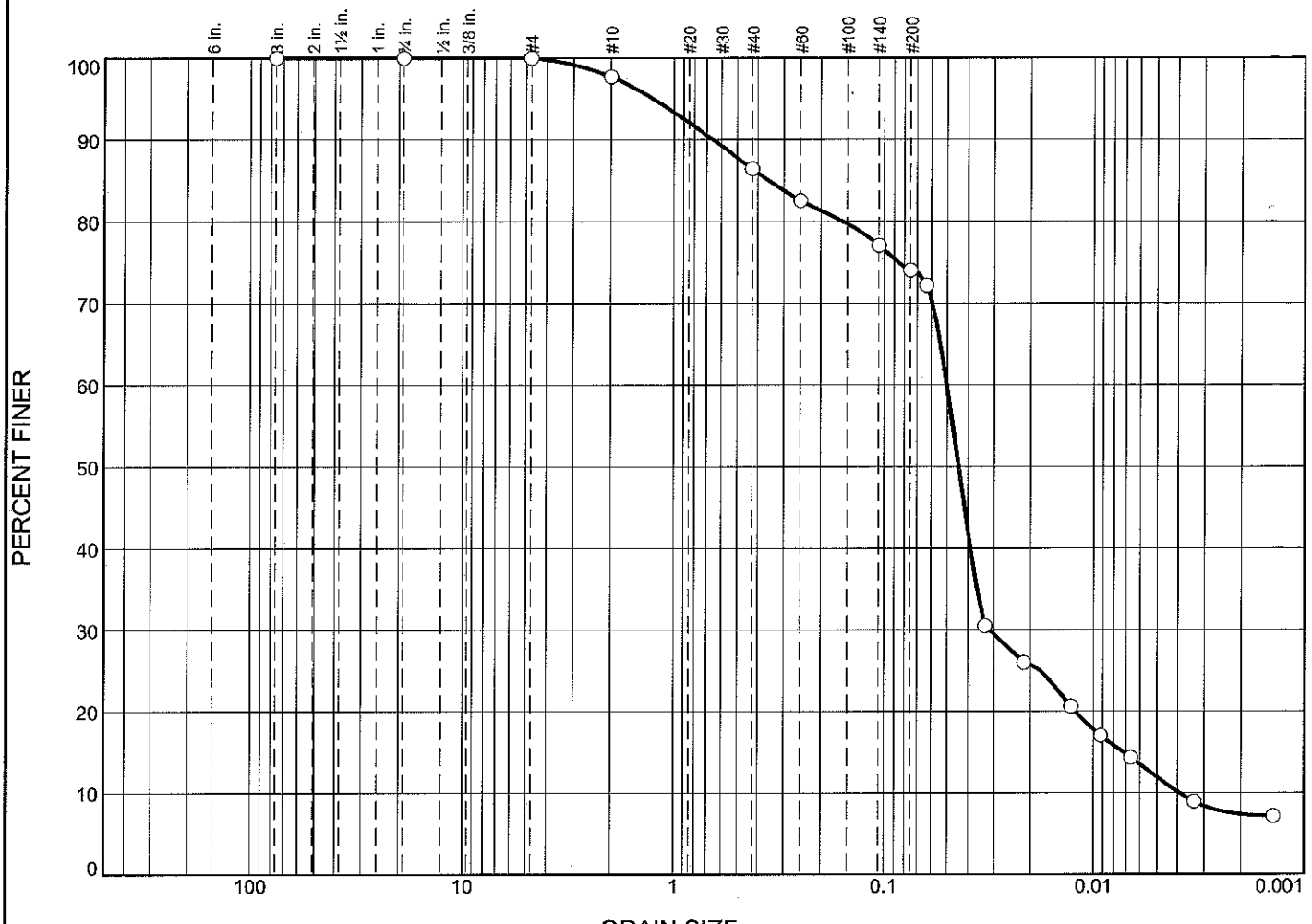
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.6	1.9	8.5	11.0	73.8	15.2	89.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0049	0.0087	0.0197	0.0402	0.0445	0.0553	0.0599	0.0878	0.1709

Fineness Modulus
0.12

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	2.3	11.3	12.4	62.1	11.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3543	0.0503	0.0442	0.0316	0.0072	0.0039	5.06	12.79

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source:** LDW-BA-SC-ENR-CC-CORE **Sample No.:** L1629119-03

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-SC-ENR-CC-CORE

Sample Number: L1629119-03

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 66.20
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
66.20	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.52	0.00	97.7
		#40	7.46	0.00	86.4
		#60	2.56	0.00	82.6
		#140	3.64	0.00	77.1
		#200	2.00	0.00	74.0
		#230	1.23	0.00	72.2

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 74.0
Weight of hydrometer sample =66.20
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0170	1.0170	0.0136	17.0	11.8	0.0331	30.5
5.00	20.0	1.0145	1.0145	0.0136	14.5	12.5	0.0215	26.0
15.00	20.0	1.0115	1.0115	0.0136	11.5	13.3	0.0128	20.6
30.00	20.0	1.0095	1.0095	0.0136	9.5	13.8	0.0092	17.0
60.00	20.0	1.0080	1.0080	0.0136	8.0	14.2	0.0066	14.3
250.00	20.0	1.0050	1.0050	0.0136	5.0	15.0	0.0033	8.9
1440.00	20.0	1.0040	1.0040	0.0136	4.0	15.2	0.0014	7.1

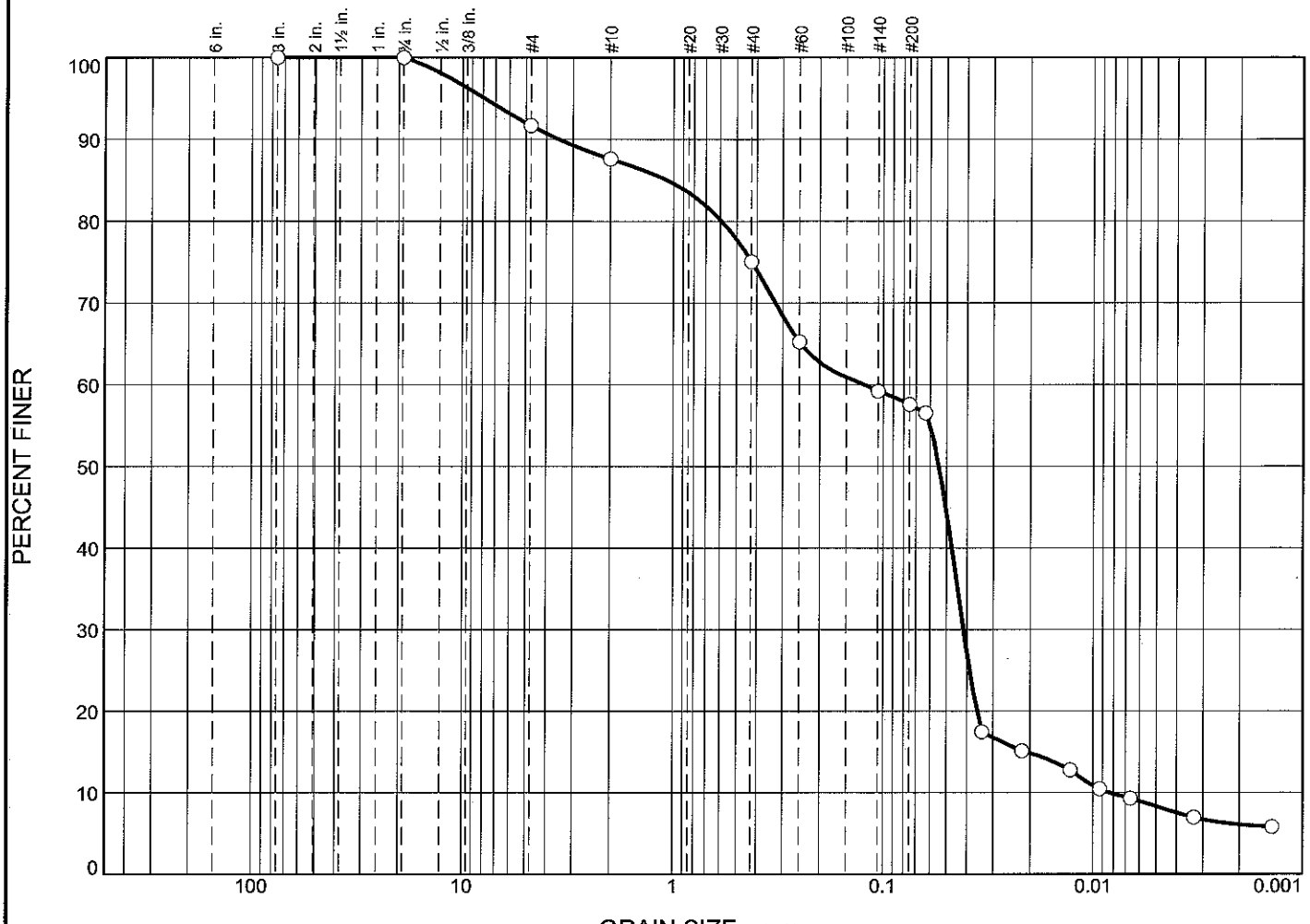
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	2.3	11.3	12.4	26.0	62.1	11.9	74.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0039	0.0072	0.0122	0.0316	0.0442	0.0503	0.1572	0.3543	0.6562	1.2583

Fineness Modulus	C_u	C_c
0.54	12.79	5.06

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	8.3	4.1	12.5	17.5	49.3	8.3

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.0747	0.1229	0.0544	0.0415	0.0210	0.0084	1.68	14.71

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source:** LDW-BA-SC-ENR AC-CA-CORE **Sample No.:** L1629119-06

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-SC-ENR AC-CA-CORE

Sample Number: L1629119-06

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 79.33
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
79.33	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	6.60	0.00	91.7
		#10	3.24	0.00	87.6
		#40	9.95	0.00	75.1
		#60	7.80	0.00	65.2
		#140	4.77	0.00	59.2
		#200	1.30	0.00	57.6
		#230	0.84	0.00	56.5

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 57.6
Weight of hydrometer sample =79.33
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0150	1.0150	0.0136	15.0	12.3	0.0339	17.5
5.00	20.0	1.0130	1.0130	0.0136	13.0	12.9	0.0219	15.1
15.00	20.0	1.0110	1.0110	0.0136	11.0	13.4	0.0129	12.8
30.00	20.0	1.0090	1.0090	0.0136	9.0	13.9	0.0093	10.5
60.00	20.0	1.0080	1.0080	0.0136	8.0	14.2	0.0066	9.3
250.00	20.0	1.0060	1.0060	0.0136	6.0	14.7	0.0033	7.0
1440.00	20.0	1.0050	1.0050	0.0136	5.0	15.0	0.0014	5.8

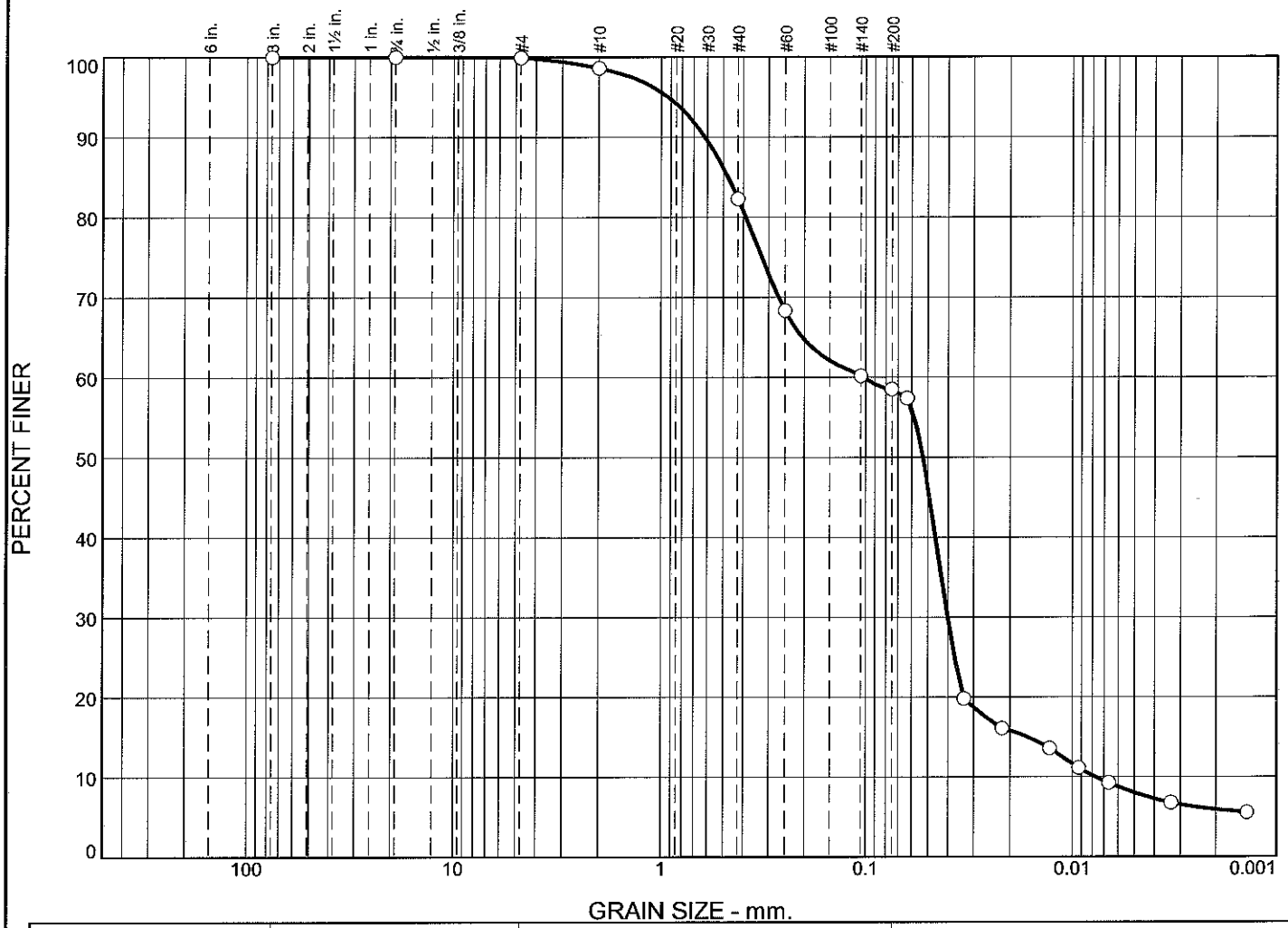
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	8.3	8.3	4.1	12.5	17.5	34.1	49.3	8.3	57.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0084	0.0210	0.0357	0.0415	0.0544	0.1229	0.5924	1.0747	3.4943	7.8620

Fineness Modulus	C_u	C_c
1.29	14.71	1.68

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	1.3	16.3	23.8	50.5	8.0

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.4760	0.1032	0.0532	0.0401	0.0165	0.0077	2.02	13.42

Material Description	USCS	AASHTO
○		

Project No. **Client:**
Project:

○ **Source:** LDW-BA-SC-ENR AC-CB-CORE **Sample No.:** L1629119-07

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-SC-ENR AC-CB-CORE

Sample Number: L1629119-07

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 75.74
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
75.74	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.06	0.00	99.9
		#10	1.00	0.00	98.6
		#40	12.35	0.00	82.3
		#60	10.59	0.00	68.3
		#140	6.17	0.00	60.2
		#200	1.25	0.00	58.5
		#230	0.85	0.00	57.4

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 58.5
Weight of hydrometer sample =75.74
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0160	1.0160	0.0136	16.0	12.1	0.0335	19.8
5.00	20.0	1.0130	1.0130	0.0136	13.0	12.9	0.0219	16.1
15.00	20.0	1.0110	1.0110	0.0136	11.0	13.4	0.0129	13.6
30.00	20.0	1.0090	1.0090	0.0136	9.0	13.9	0.0093	11.1
60.00	20.0	1.0075	1.0075	0.0136	7.5	14.3	0.0067	9.3
250.00	20.0	1.0055	1.0055	0.0136	5.5	14.8	0.0033	6.8
1440.00	20.0	1.0045	1.0045	0.0136	4.5	15.1	0.0014	5.6

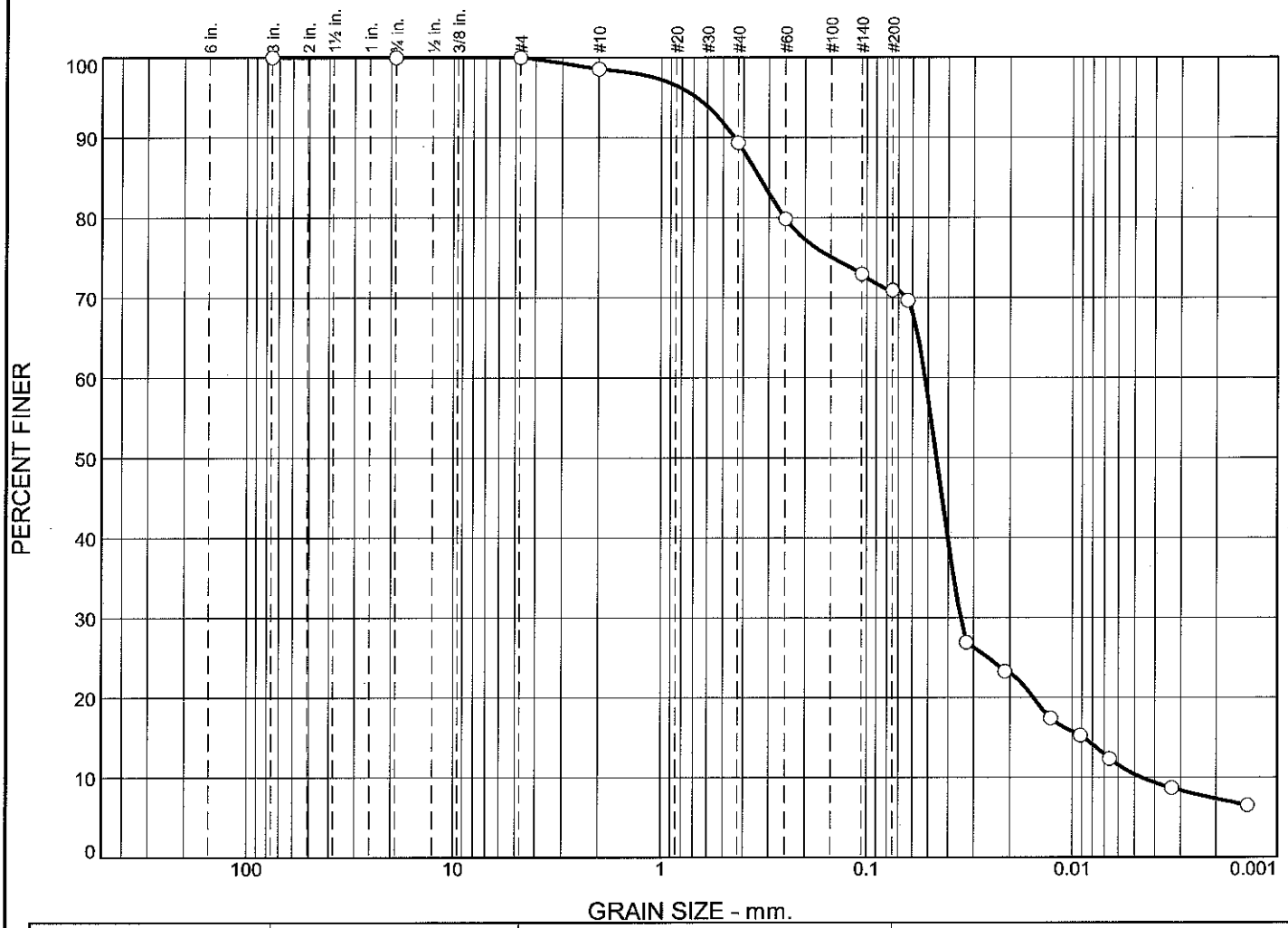
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	1.3	16.3	23.8	41.4	50.5	8.0	58.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0077	0.0165	0.0337	0.0401	0.0532	0.1032	0.3897	0.4760	0.6180	0.9310

Fineness Modulus	C_u	C_c
0.80	13.42	2.02

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.4	9.3	18.4	60.5	10.4

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3351	0.0519	0.0455	0.0347	0.0088	0.0046	5.01	11.18

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source:** LDW-BA-SC-ENR AC-CC-CORE **Sample No.:** L1629119-08

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-SC-ENR AC-CC-CORE

Sample Number: L1629119-08

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 78.20
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
78.20	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.13	0.00	98.6
		#40	7.20	0.00	89.3
		#60	7.42	0.00	79.9
		#140	5.41	0.00	72.9
		#200	1.57	0.00	70.9
		#230	0.99	0.00	69.7

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 70.9
Weight of hydrometer sample =78.20
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0185	1.0185	0.0136	18.5	11.4	0.0326	26.9
5.00	20.0	1.0160	1.0160	0.0136	16.0	12.1	0.0212	23.3
15.00	20.0	1.0120	1.0120	0.0136	12.0	13.1	0.0128	17.4
30.00	20.0	1.0105	1.0105	0.0136	10.5	13.5	0.0092	15.3
60.00	20.0	1.0085	1.0085	0.0136	8.5	14.0	0.0066	12.3
250.00	20.0	1.0060	1.0060	0.0136	6.0	14.7	0.0033	8.7
1440.00	20.0	1.0045	1.0045	0.0136	4.5	15.1	0.0014	6.5

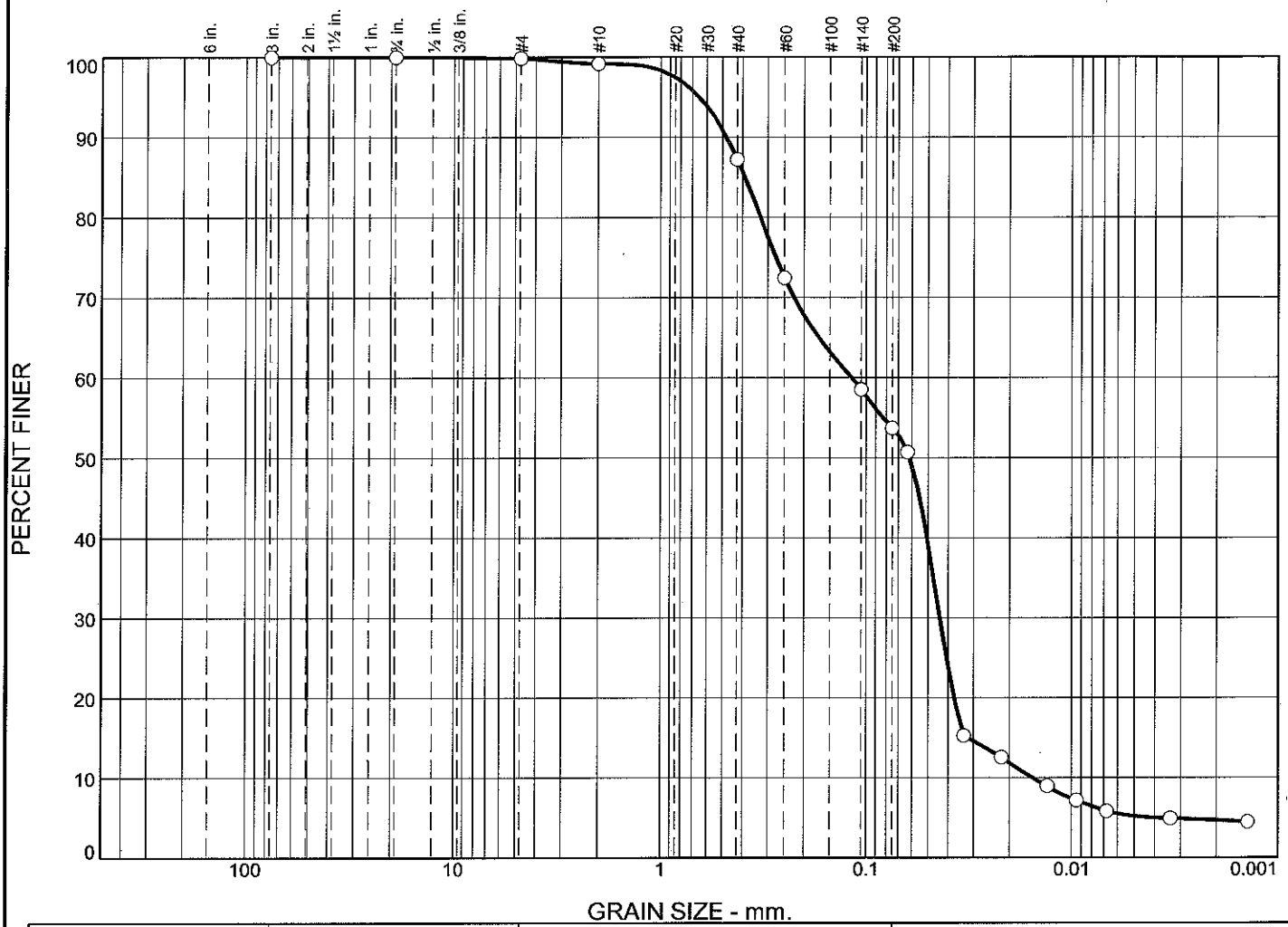
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.4	9.3	18.4	29.1	60.5	10.4	70.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0046	0.0088	0.0154	0.0347	0.0455	0.0519	0.2524	0.3351	0.4425	0.6786

Fineness Modulus	C_u	C_c
0.52	11.18	5.01

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	0.6	12.0	33.5	48.5	5.2

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3907	0.1181	0.0616	0.0438	0.0321	0.0154	1.05	7.64

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source:** LDW-BA-IN-ENR-CA-CORE **Sample No.:** L1629119-11

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-IN-ENR-CA-CORE

Sample Number: L1629119-11

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 95.94
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
95.94	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.17	0.00	99.8
		#10	0.63	0.00	99.2
		#40	11.49	0.00	87.2
		#60	14.14	0.00	72.5
		#140	13.37	0.00	58.5
		#200	4.62	0.00	53.7
		#230	2.85	0.00	50.7

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 53.7
Weight of hydrometer sample =95.94
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 1
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0160	1.0170	0.0136	16.0	12.1	0.0335	15.3
5.00	20.0	1.0130	1.0140	0.0136	13.0	12.9	0.0219	12.6
15.00	20.0	1.0090	1.0100	0.0136	9.0	13.9	0.0131	9.0
30.00	20.0	1.0070	1.0080	0.0136	7.0	14.4	0.0095	7.2
60.00	20.0	1.0055	1.0065	0.0136	5.5	14.8	0.0068	5.8
250.00	20.0	1.0045	1.0055	0.0136	4.5	15.1	0.0034	4.9
1440.00	20.0	1.0040	1.0050	0.0136	4.0	15.2	0.0014	4.5

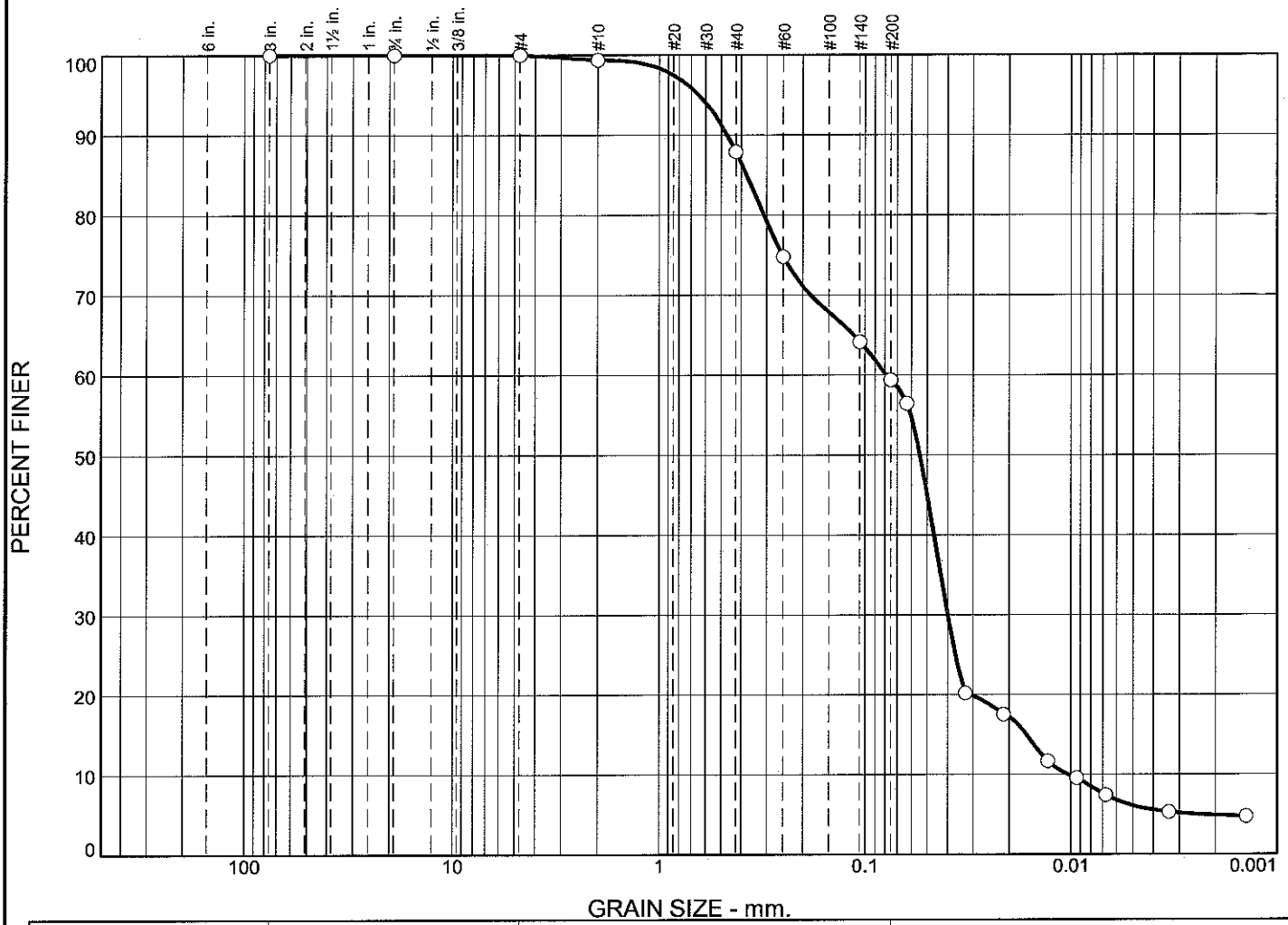
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.2	0.2	0.6	12.0	33.5	46.1	48.5	5.2	53.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0154	0.0321	0.0373	0.0438	0.0616	0.1181	0.3280	0.3907	0.4810	0.6541

Fineness Modulus	C_u	C_c
0.68	7.64	1.05

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.6	11.5	28.5	53.3	6.1

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3774	0.0789	0.0544	0.0399	0.0165	0.0102	1.98	7.71

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source:** LDW-BA-IN-ENR-CB-CORE **Sample No.:** L1629119-12

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-IN-ENR-CB-CORE

Sample Number: L1629119-12

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 89.52
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
89.52	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.55	0.00	99.4
		#40	10.30	0.00	87.9
		#60	11.72	0.00	74.8
		#140	9.52	0.00	64.2
		#200	4.28	0.00	59.4
		#230	2.63	0.00	56.4

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 59.4
Weight of hydrometer sample =89.52
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 1
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0180	1.0190	0.0136	18.0	11.5	0.0328	20.2
5.00	20.0	1.0155	1.0165	0.0136	15.5	12.2	0.0213	17.5
15.00	20.0	1.0100	1.0110	0.0136	10.0	13.6	0.0130	11.7
30.00	20.0	1.0080	1.0090	0.0136	8.0	14.2	0.0094	9.6
60.00	20.0	1.0060	1.0070	0.0136	6.0	14.7	0.0068	7.4
250.00	20.0	1.0040	1.0050	0.0136	4.0	15.2	0.0034	5.3
1440.00	20.0	1.0035	1.0045	0.0136	3.5	15.4	0.0014	4.8

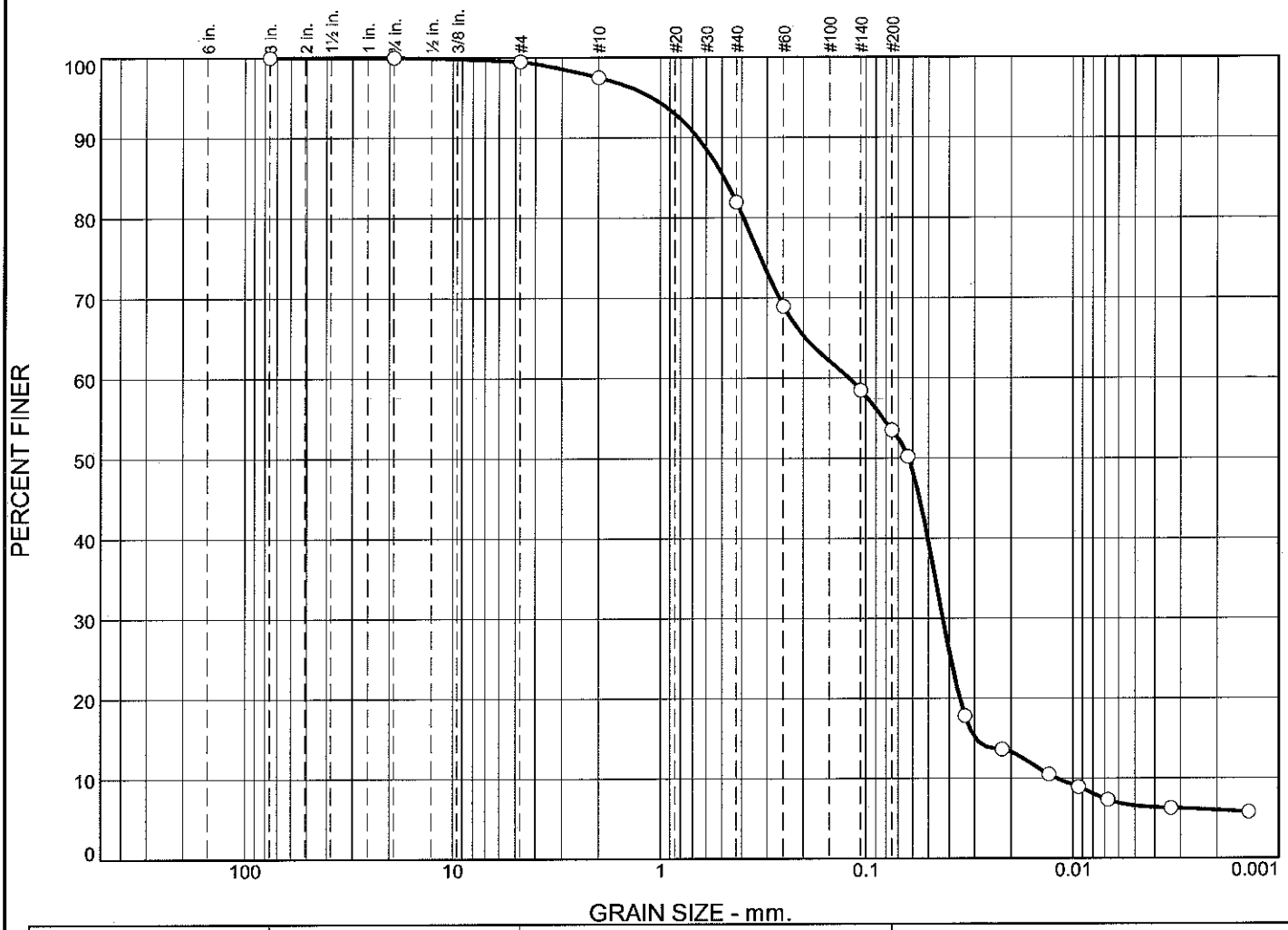
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.6	11.5	28.5	40.6	53.3	6.1	59.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0102	0.0165	0.0310	0.0399	0.0544	0.0789	0.3115	0.3774	0.4696	0.6471

Fineness Modulus	C_u	C_c
0.61	7.71	1.98

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.5	2.0	15.6	28.4	46.9	6.6

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.4901	0.1209	0.0626	0.0428	0.0297	0.0120	1.26	10.04

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source:** LDW-BA-IN-ENR-CC-CORE **Sample No.:** L1629119-13

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-IN-ENR-CC-CORE

Sample Number: L1629119-13

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 81.74
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
81.74	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.44	0.00	99.5
		#10	1.61	0.00	97.5
		#40	12.73	0.00	81.9
		#60	10.62	0.00	68.9
		#140	8.54	0.00	58.5
		#200	4.07	0.00	53.5
		#230	2.70	0.00	50.2

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 53.5
Weight of hydrometer sample =81.74
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 1
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0160	1.0170	0.0136	16.0	12.1	0.0335	17.8
5.00	20.0	1.0120	1.0130	0.0136	12.0	13.1	0.0221	13.6
15.00	20.0	1.0090	1.0100	0.0136	9.0	13.9	0.0131	10.5
30.00	20.0	1.0075	1.0085	0.0136	7.5	14.3	0.0094	8.9
60.00	20.0	1.0060	1.0070	0.0136	6.0	14.7	0.0068	7.3
250.00	20.0	1.0050	1.0060	0.0136	5.0	15.0	0.0033	6.3
1440.00	20.0	1.0045	1.0055	0.0136	4.5	15.1	0.0014	5.8

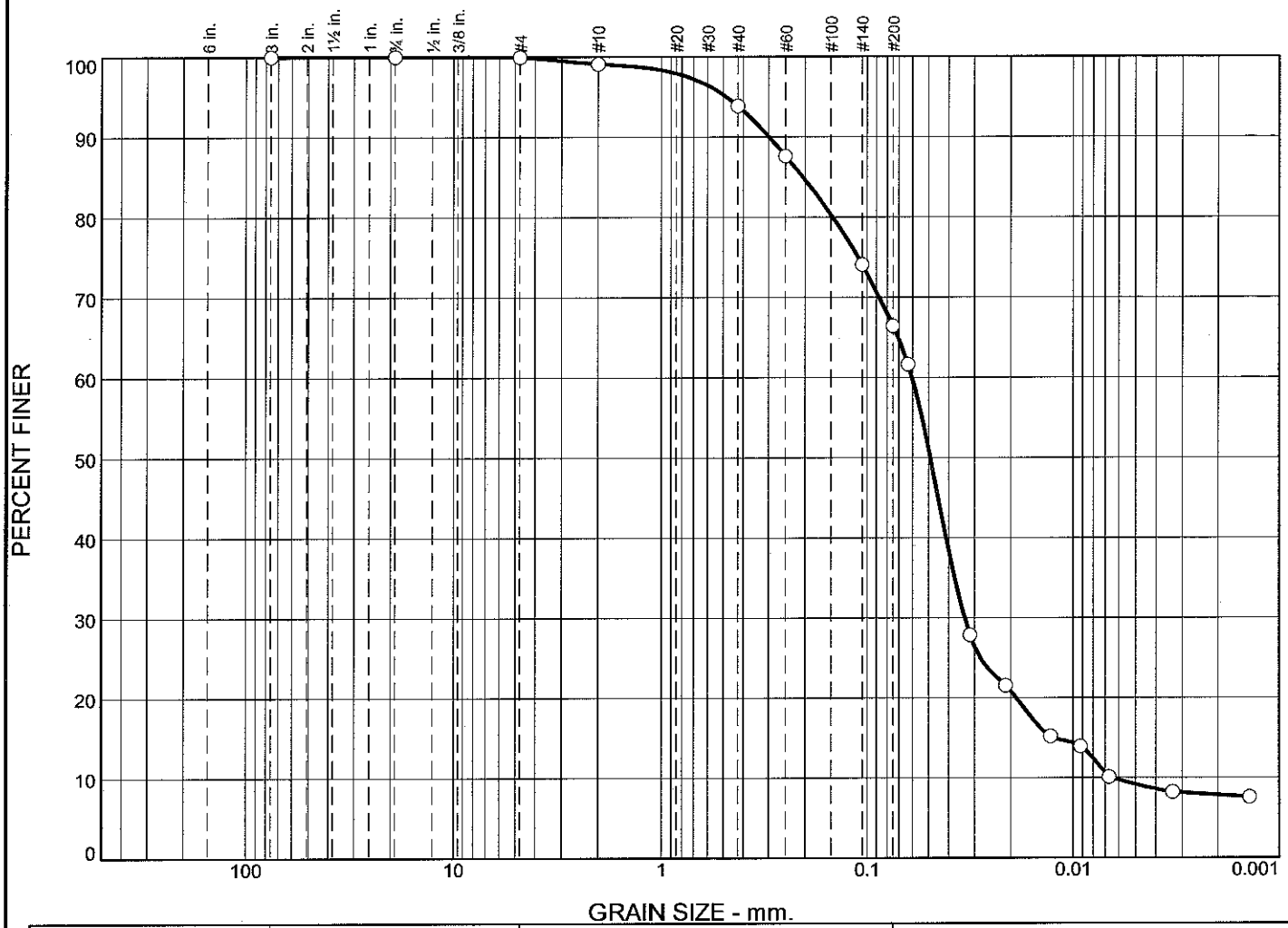
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.5	0.5	2.0	15.6	28.4	46.0	46.9	6.6	53.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0120	0.0297	0.0355	0.0428	0.0626	0.1209	0.3927	0.4901	0.6608	1.1053

Fineness Modulus	C_u	C_c
0.84	10.04	1.26

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	0.8	5.2	27.5	57.2	9.2

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2059	0.0603	0.0492	0.0336	0.0125	0.0065	2.88	9.30

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source:** LDW-BA-IN-ENR AC-CA-CORE **Sample No.:** L1629119-14

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-IN-ENR AC-CA-CORE

Sample Number: L1629119-14

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 84.10
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
84.10	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.05	0.00	99.9
		#10	0.71	0.00	99.1
		#40	4.40	0.00	93.9
		#60	5.26	0.00	87.6
		#140	11.39	0.00	74.1
		#200	6.43	0.00	66.4
		#230	4.02	0.00	61.6

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 66.4
Weight of hydrometer sample =84.10
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 1
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0210	1.0220	0.0136	21.0	10.7	0.0316	27.9
5.00	20.0	1.0160	1.0170	0.0136	16.0	12.1	0.0212	21.5
15.00	20.0	1.0110	1.0120	0.0136	11.0	13.4	0.0129	15.2
30.00	20.0	1.0100	1.0110	0.0136	10.0	13.6	0.0092	13.9
60.00	20.0	1.0070	1.0080	0.0136	7.0	14.4	0.0067	10.1
250.00	20.0	1.0055	1.0065	0.0136	5.5	14.8	0.0033	8.2
1440.00	20.0	1.0050	1.0060	0.0136	5.0	15.0	0.0014	7.6

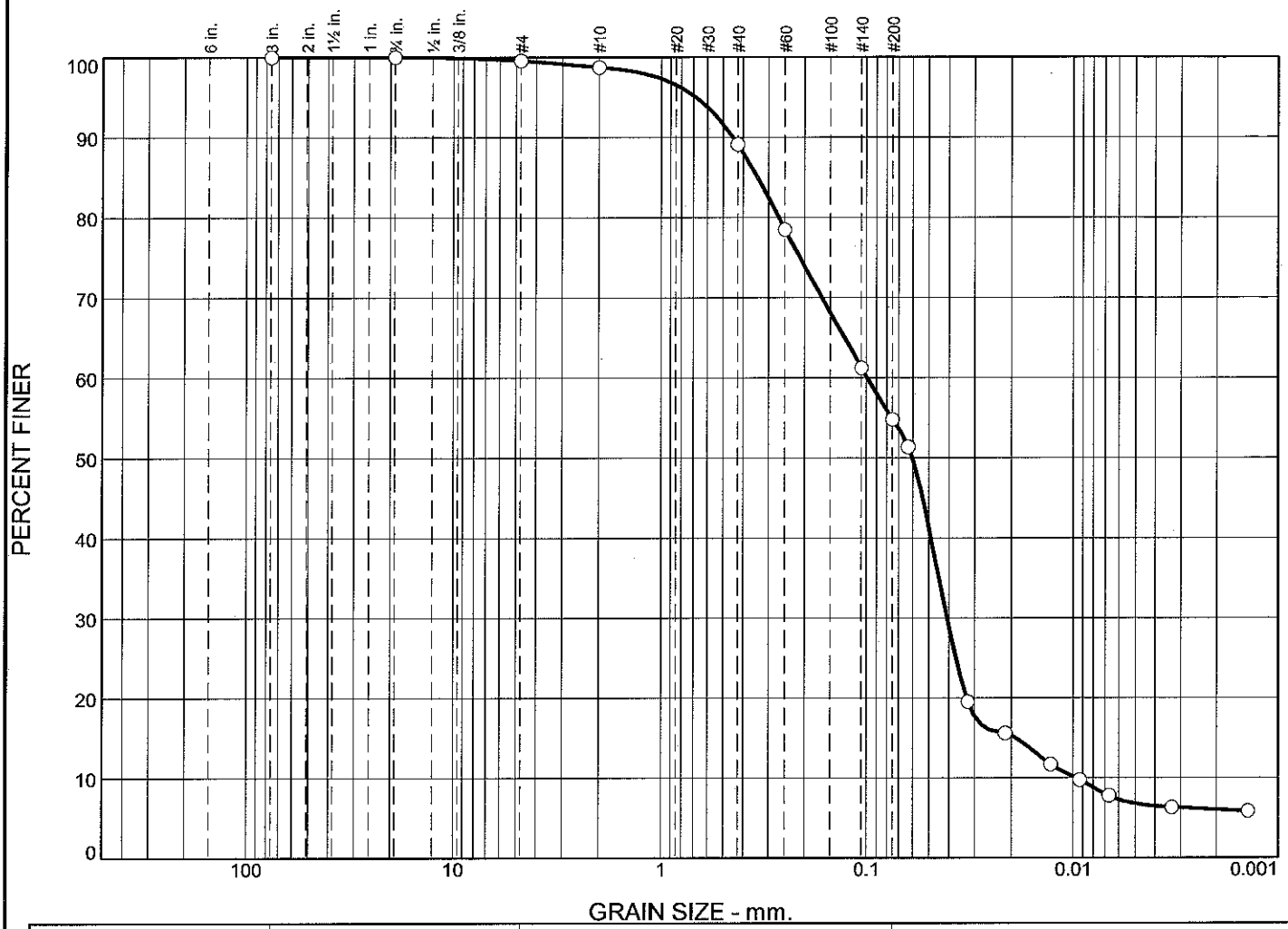
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.8	5.2	27.5	33.5	57.2	9.2	66.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0065	0.0125	0.0189	0.0336	0.0492	0.0603	0.1472	0.2059	0.3008	0.4846

Fineness Modulus	C_u	C_c
0.36	9.30	2.88

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.5	0.8	9.6	34.3	48.0	6.8

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3410	0.0996	0.0604	0.0410	0.0190	0.0097	1.73	10.24

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source:** LDW-BA-IN-ENR AC-CB-CORE **Sample No.:** L1629119-15

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-IN-ENR AC-CB-CORE

Sample Number: L1629119-15

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 90.10
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
90.10	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.41	0.00	99.5
		#10	0.74	0.00	98.7
		#40	8.66	0.00	89.1
		#60	9.59	0.00	78.5
		#140	15.53	0.00	61.2
		#200	5.79	0.00	54.8
		#230	3.09	0.00	51.4

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 54.8
Weight of hydrometer sample =90.10
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 1
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0190	1.0200	0.0136	19.0	11.3	0.0324	19.5
5.00	20.0	1.0150	1.0160	0.0136	15.0	12.3	0.0214	15.6
15.00	20.0	1.0110	1.0120	0.0136	11.0	13.4	0.0129	11.7
30.00	20.0	1.0090	1.0100	0.0136	9.0	13.9	0.0093	9.7
60.00	20.0	1.0070	1.0080	0.0136	7.0	14.4	0.0067	7.8
250.00	20.0	1.0055	1.0065	0.0136	5.5	14.8	0.0033	6.3
1440.00	20.0	1.0050	1.0060	0.0136	5.0	15.0	0.0014	5.8

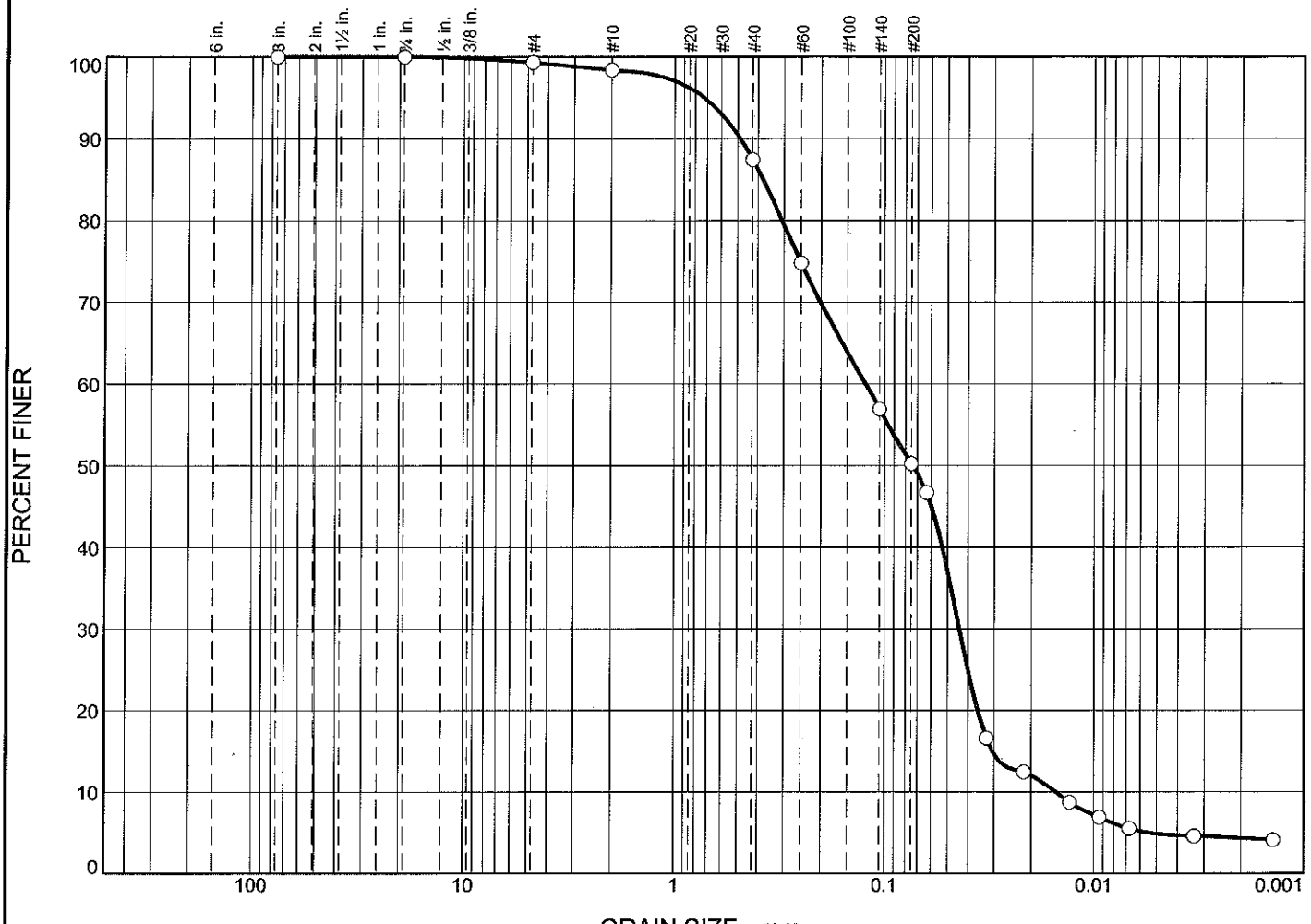
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.5	0.5	0.8	9.6	34.3	44.7	48.0	6.8	54.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0097	0.0190	0.0329	0.0410	0.0604	0.0996	0.2687	0.3410	0.4489	0.6834

Fineness Modulus	C_u	C_c
0.60	10.24	1.73

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.7	0.9	11.0	37.2	45.3	4.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3798	0.1237	0.0740	0.0440	0.0307	0.0153	1.03	8.09

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source:** LDW-BA-IN-ENR AC-CC-CORE **Sample No.:** L1629119-16

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-IN-ENR AC-CC-CORE

Sample Number: L1629119-16

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 87.43
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
87.43	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.61	0.00	99.3
		#10	0.80	0.00	98.4
		#40	9.58	0.00	87.4
		#60	11.05	0.00	74.8
		#140	15.62	0.00	56.9
		#200	5.85	0.00	50.2
		#230	3.09	0.00	46.7

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 50.2
Weight of hydrometer sample =87.43
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0180	1.0180	0.0136	18.0	11.5	0.0328	16.6
5.00	20.0	1.0135	1.0135	0.0136	13.5	12.7	0.0218	12.4
15.00	20.0	1.0095	1.0095	0.0136	9.5	13.8	0.0131	8.7
30.00	20.0	1.0075	1.0075	0.0136	7.5	14.3	0.0094	6.9
60.00	20.0	1.0060	1.0060	0.0136	6.0	14.7	0.0068	5.5
250.00	20.0	1.0050	1.0050	0.0136	5.0	15.0	0.0033	4.6
1440.00	20.0	1.0045	1.0045	0.0136	4.5	15.1	0.0014	4.1

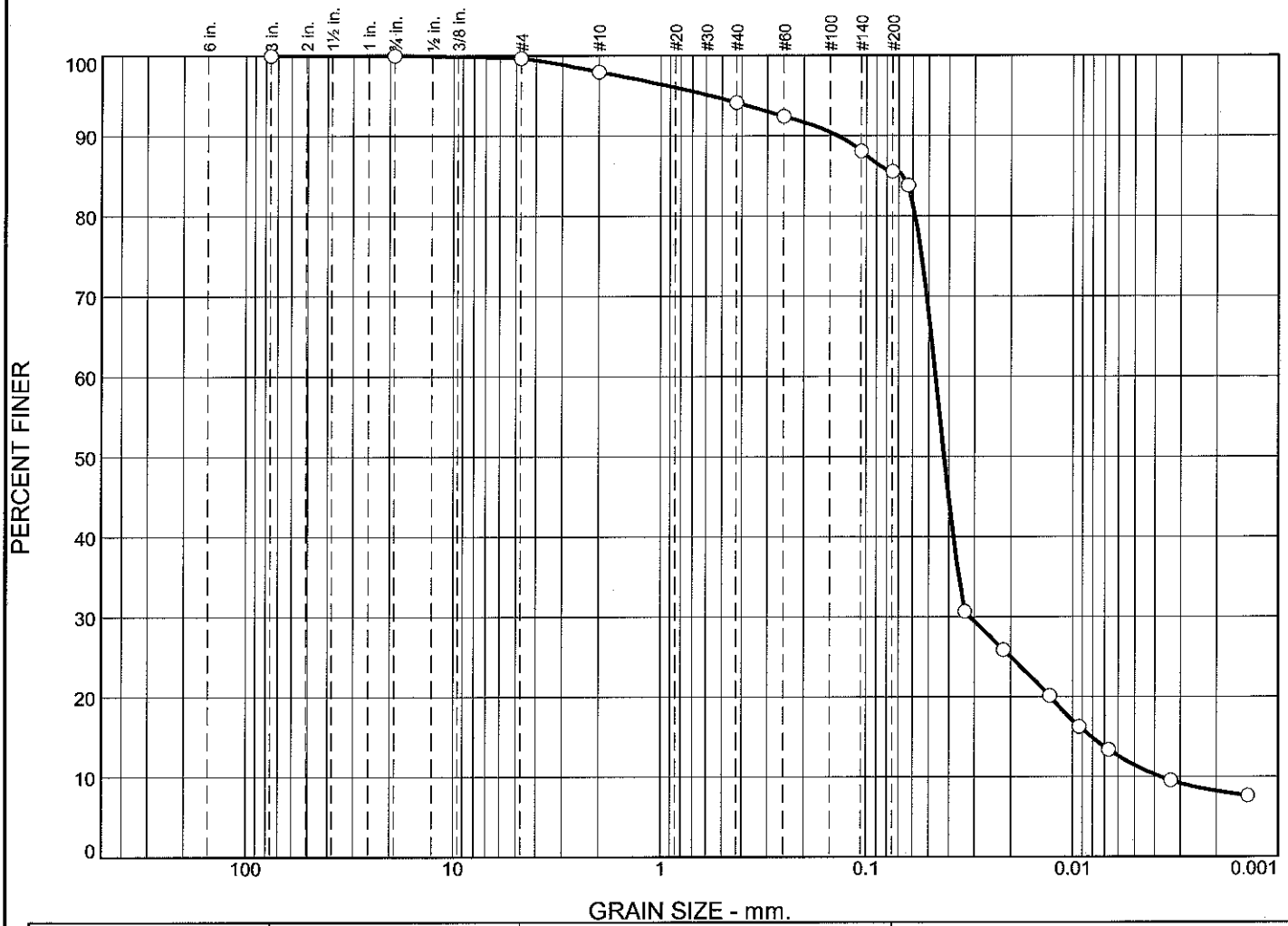
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.7	0.7	0.9	11.0	37.2	49.1	45.3	4.9	50.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0153	0.0307	0.0360	0.0440	0.0740	0.1237	0.3087	0.3798	0.4881	0.7257

Fineness Modulus	C_u	C_c
0.69	8.09	1.03

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	1.7	3.9	8.5	74.1	11.5

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.0664	0.0464	0.0421	0.0315	0.0081	0.0037	5.72	12.41

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source:** LDW-BA-SC-ENR-CA-CORE **Sample No.:** L1629119-18

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/6/2016

Location: LDW-BA-SC-ENR-CA-CORE

Sample Number: L1629119-18

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 71.51
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
71.51	0.00	3"	0.00	0.00	100.0
		.75"	0.00	0.00	100.0
		#4	0.25	0.00	99.7
		#10	1.20	0.00	98.0
		#40	2.74	0.00	94.1
		#60	1.24	0.00	92.4
		#140	3.11	0.00	88.1
		#200	1.79	0.00	85.6
		#230	1.25	0.00	83.8

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 85.6
Weight of hydrometer sample =71.51
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = 0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 151H
Hydrometer effective depth equation: L = 16.294964 - 0.2645 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
2.00	20.0	1.0160	1.0160	0.0136	16.0	12.1	0.0335	30.7
5.00	20.0	1.0135	1.0135	0.0136	13.5	12.7	0.0218	25.9
15.00	20.0	1.0105	1.0105	0.0136	10.5	13.5	0.0130	20.1
30.00	20.0	1.0085	1.0085	0.0136	8.5	14.0	0.0093	16.3
60.00	20.0	1.0070	1.0070	0.0136	7.0	14.4	0.0067	13.4
250.00	20.0	1.0050	1.0050	0.0136	5.0	15.0	0.0033	9.6
1440.00	20.0	1.0040	1.0040	0.0136	4.0	15.2	0.0014	7.6

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	1.7	3.9	8.5	14.1	74.1	11.5	85.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0037	0.0081	0.0128	0.0315	0.0421	0.0464	0.0582	0.0664	0.1382	0.5703

Fineness Modulus	C_u	C_c
0.27	12.41	5.72

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: ***EPA 3050B***

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

Mansfield Facility:

Drinking Water
EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

MANSFIELD CHAIN OF CUSTODY

PAGE 1 OF 2

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 9/15/16

ALPHA Job #: TBD L1629119

Project Information

Project Name: LDW ENR/AC Pilot Study

Project Location: LDW

Project #: TBD

Project Manager: Liz Porta

ALPHA Quote #: M2015033

Report Information Data Deliverables

☐ FAX ☒ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program | Criteria

Client Information

Client: Amec Foster Wheeler

Address: 3500 188TH St. SW, Suite 601

Lynnwood, WA 98037

Phone: 425-921-4023

Fax:

Email: cliff.whitmus@amecfw.com

☐ These samples have been Previously analyzed by Alpha

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: TBD Time: TBD

Other Project Specific Requirements/Comments/Detection Limits:

POC: Gretchen Heavner- gretchen.heavner@floydsnider.com #206.292.2078

☒ MS/MSD (at unit cost) will be omitted unless you check here

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	TOC EPA 9060A(m)	GS ASTM D422 using #230 sieve	Black Carbon Gustafsson (1997)										Sample Specific Comments	TOTAL # BOTTLES
	~~See attached COC forms~~			sediment	—	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	See attached	1
2919-01	LDW-BA-SC-ENR-CA-CORE	9/10/16	1305		JL	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-02	CB		1210			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-03	CC		1225			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-04	CD		1335			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-05	CE	9/12/16	1145		BWG	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-06	LDW-BA-SC-ENR+AC-CA-CORE	9/09/16	1008		JL	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-07	CB		0945			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-08	CC		1600			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-09	CD		1630			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
					Container Type	A	A	A	-	-	-	-	-	-	-	-	-		
					Preservative	A	A	A	-	-	-	-	-	-	-	-	-		

Relinquished By:	Date/Time	Received By:	Date/Time
Julia Levengood	9/14/16 1430	Fedex	
Fedex	9/15/16 9:53		9/15/16 9:53

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FORM NO: 101-09(I-NJ) (rev. 5-JAN-12)

MANSFIELD CHAIN OF CUSTODY

PAGE 2 OF 2

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 9/15/16

ALPHA Job #: TBD L1629119

Project Information

Project Name: LDW ENR/AC Pilot Study

Project Location: LDW

Project #: TBD

Project Manager: Liz Porta

ALPHA Quote #: M2015033

Report Information Data Deliverables

☐ FAX ☒ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program Criteria

Client Information

Client: Amec Foster Wheeler

Address: 3500 188TH St. SW, Suite 601

Lynnwood, WA 98037

Phone: 425-921-4023

Fax:

Email: cliff.whitmus@amecfw.com

☐ These samples have been Previously analyzed by Alpha

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: TBD Time: TBD

Other Project Specific Requirements/Comments/Detection Limits:

POC: Gretchen Heavner- gretchen.heavner@floydsnider.com #206.292.2078

☒ MS/MSD (at unit cost) will be omitted unless you check here

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	TOC EPA 9060A(m)	GS ASTM D422 using #230 sieve	Black Carbon Gustafsson (1997)										Sample Specific Comments	TOTAL # BOTTLES
	~~See attached COC forms~~			sediment	—	☒	☒	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	See attached	1
-10	LDW-BA-SC-ENR+AC-CE-CORE	9/09/16	1650		JL	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-11	LDW-BA-IN-ENR-CA-CORE	9/14/16	1130			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-12	CB		1040			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-13	CC		1142			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-14	LDW-BA-IN-ENR+AC-CA-CORE	9/14/16	1020			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-15	CB-		1055			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-16	CC		0957			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
-17	CD	9/12/16	1140		BWG	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
				Container Type		A	A	A	-	-	-	-	-	-	-	-	-		
				Preservative		A	A	A	-	-	-	-	-	-	-	-	-		

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ALPHA Quote #: M2015033

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Billing Information

☒ Same as Client info PO #:

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State/Fed Program | Criteria

Client Information

Client: Amec Foster Wheeler

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Lynnwood, WA 98037

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Fax:

Email: cliff.whitmus@amecfw.com

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ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
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	LDW-BA-SC-ENR-CA-CORE	9/10/16	1305		JL	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CB		1210			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CC		1225			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CD		1335			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CE	9/12/16	1145		BWG	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	LDW-BA-SC-ENR+AC-CA-CORE	9/09/16	1008		JL	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CB		0945			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CC		1600			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CD		1630			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
					Container Type	A	A	A	-	-	-	-	-	-	-	-	-		
					Preservative	A	A	A	-	-	-	-	-	-	-	-	-		

Relinquished By:	Date/Time	Received By:	Date/Time
Julia Levengood	9/14/16 1440	Fedex	
Fedex	9/15/16 9:53	[illegible]	9/15/16 9:53

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	LDW-BA-IN-ENR-CA-CORE	9/14/16	1130			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CB		1040			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CC		1142			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	LDW-BA-IN-ENR+AC-CA-CORE	9/14/16	1020			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CB		1055			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CC		0957			☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
	CD	9/13/16	1140		BWG	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
						☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
				Container Type		A	A	A	-	-	-	-	-	-	-	-	-		
				Preservative		A	A	A	-	-	-	-	-	-	-	-	-		

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