Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
Portland Harbor Superfund Site
Subsurface Sediment
Review of Atterberg Limits

AECOM Job Number: 60566335.2.12
Reviewers: K. Yang, PE
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Date: 01/03/2019

OBJECTIVE:
To confirm Atterberg Limits testing was performed properly, results were calculated correctly, and test results are reasonable.

REVIEW:
Subsurface sediment samples were submitted to the TestAmerica Laboratories, Incorporated (TA) located in Burlington, Vermont for Atterberg Limits using ASTM D4318 (Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils).

Sample cross-reference for samples tested for Atterberg Limits:

Client Sample ID	Lab Group ID	Lab Sample ID	Plasticity Not Determined*
PDI-SC-S034-1.8to4	580-79019-3	580-79019-6	
PDI-SC-S038-2to3.4	580-79257-4	580-79257-16	
PDI-SC-S038-5.4to7.2		580-79257-18	x
PDI-SC-S178-0to2	580-79329-3	580-79329-17	
PDI-SC-S218-6to8		580-79329-37	
PDI-SC-S257-2to4	580-79389-3	580-79389-8	
PDI-SC-S105-4to5.6	580-79444-3	580-79444-33	x
PDI-SC-S198-0to2	580-79504-3	580-79504-20	
PDI-SC-S238-4to6		580-79504-43	
PDI-SC-S139-2to4		580-79504-48	x
PDI-SC-S007-2to4	580-79555-3	580-79555-8	
PDI-SC-S151-2to4	580-79626-3	580-79626-1	
PDI-SC-S092-2to4		580-79626-29	
PDI-SC-S065-2to4		580-79626-36	
PDI-SC-S131-2to4	580-79672-3	580-79672-15	
PDI-SC-S232-0to2		580-79672-25	
PDI-SC-S263-0to2		580-79672-28	x
PDI-SC-S157-0to2		580-79672-38	
PDI-SC-S053-0to2		580-79672-48	

The laboratory prepared the samples as described in the laboratory's SOP No. BR-GT-011, Rev. 8 dated 7/5/2016. The SOP is based on reference method ASTM D4318-05.

Liquid Limit (LL) – The liquid limits were determined using the Multipoint Liquid Limit – Method A. The blows for soil plastic limits are within 15 to 25, 20 to 30, and 25 to 35 blows as required.

Plastic Limit (PL) – The tests were performed using the required 6 grams (g) of material with the exception of PDI-SC-S038-2to3.4 (5.57g on 1st test), PDI-SC-S218-6to8 (5.91g on 1st test), PDI-SC-S238-4to6 (5.20g and 5.42g on the 1st and 2nd tests, respectively), PDI-SC-S198-0to2 (5.59g on the 2nd test), PDI-SC-S151-2to4 (5.61g on 2nd test), PDI-SC-S092-2to4 (5.78g on 1st test), PDI-SC-S232-0to2 (5.45g 2nd test) and PDI-SC-S157-0to2 (5.95g on 2nd test). Based on the limited difference between the two results for water content for each of these samples, the lower mass used for the testing does not compromise the final results.

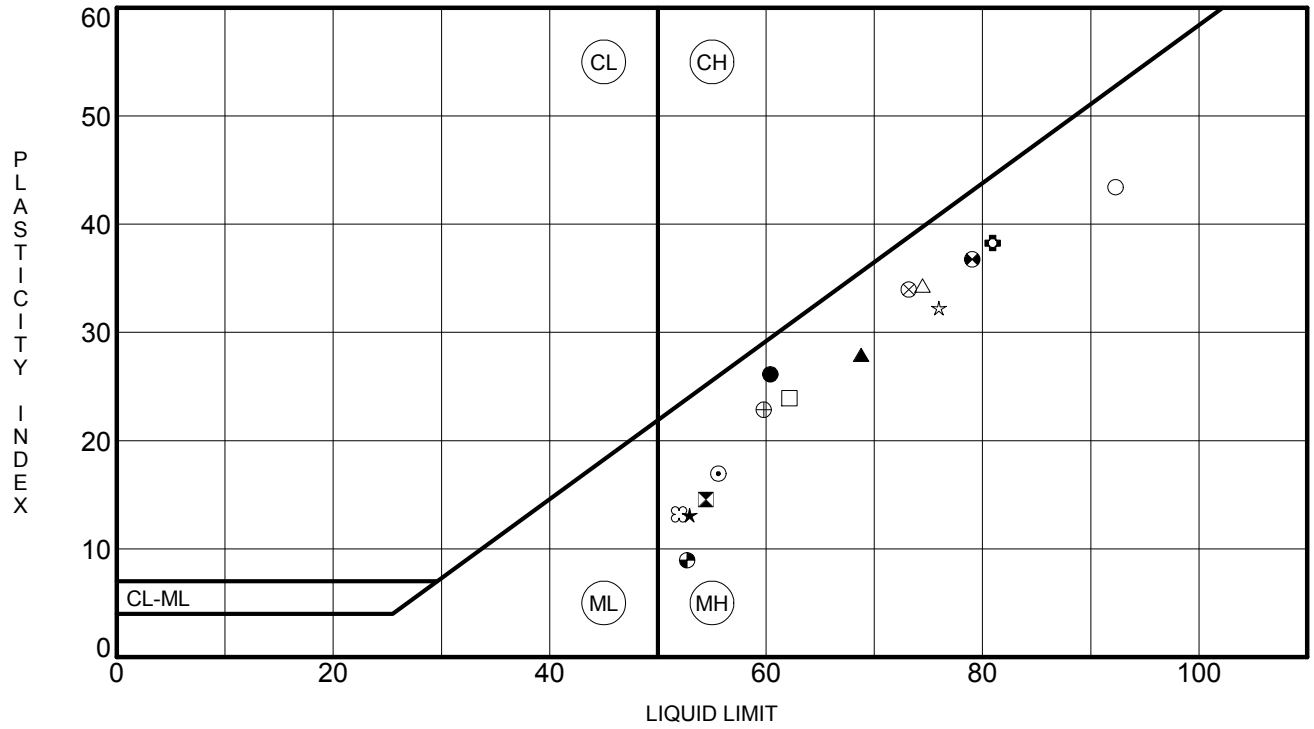
Plasticity Index (PI) – The laboratory calculated plasticity index using the formula

$$PI = LL - PL$$

as prescribed in the method.

Calculation Checks – The raw data provided by the laboratory in the level 4 packages was input to the gINT program for Atterberg Limits calculation to check the correctness of the reported results. The results were calculated correctly. All the results appear reasonable based on the testing results.

Other Notes:
The PI was not determined by the laboratory for samples PDI-SC-S038-5.4to7.2, PDI-SC-S105-4to5.6, PDI-SC-S139-2to4, and PDI-SC-S263-0to2. The PI for these samples was not able to be determined because the PL could not be determined for each sample. Due to the fine sand present in the samples, the laboratory was not able to perform the 'roll' procedure to create a 1/8" diameter thread as required by the method. The samples were reported as 0/0 NP because one or both of the limits (LL or PL) could not be determined.



Specimen Identification		LL	PL	PI	Moisture	Classification
●	580-79019-6 1.8 to 4 ft	60	34	26		Elastic SILT
⧓	580-79257-16 2 to 3.4 ft	54	39	15		Elastic SILT
▲	580-79329-17 0 to 2 ft	69	41	28		Elastic SILT
★	580-79329-37 6 to 8 ft	53	40	13		Elastic SILT
⊙	580-79389-8 2 to 4 ft	56	39	17		Elastic SILT
✿	580-79504-20 0 to 2 ft	81	43	38		Elastic SILT
○	580-79504-43 4 to 6 ft	92	49	43		Elastic SILT
△	580-79555-8 2 to 4 ft	75	40	35		Elastic SILT
⊗	580-79626-1 2 to 4 ft	73	39	34		Elastic SILT
⊕	580-79626-29 2 to 4 ft	60	37	23		Elastic SILT
□	580-79626-36 2 to 4 ft	62	38	24		Elastic SILT
◓	580-79672-15 2 to 4 ft	79	42	37		Elastic SILT
◕	580-79672-25 0 to 2 ft	53	44	9		Elastic SILT
☆	580-79672-38 0 to 2 ft	76	44	32		Elastic SILT
⁂	580-79672-48 0 to 2 ft	52	39	13		Elastic SILT

ATTERBERG LIMITS RESULTS

Project: Portland Harbor Pre-Remedial Design
Project Location: Portland, Oregon
Project Number: 60566335

AECOM

Figure

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